Appendix A
Sampling and Compositing Plan

BACKGROUND

HDR | LMS and Aqua Survey Inc. are planning to characterize the dredged materials stored in several Confined Disposal Facilities (CDF's) throughout New Jersey for the New Jersey Department of Transportation Office of Maritime Resources (NJDOT/OMR). This project will be carried out under the I Boat New Jersey program. The purpose of the project is to characterize the physical and chemical properties of the materials sufficiently to obtain an Acceptable Use Determination (AUD) from your office for their beneficial use. The purpose of this report is to describe our proposed sampling plans for the CDF's and the methods that we used to determine the number of samples, sampling locations, and analytical requirements. We hope to obtain a guidance letter from your office prior to the sampling events.

We plan to sample the following five CDF's:

1. Nummy Island in the Town of Stone Harbor, NJ
2. Middle Thorofare in Cape May, NJ
3. Site 83 in Ocean City, NJ
4. Corps Site D in Cape May, NJ
5. Waackaack Creek in Keansburg, NJ

METHODOLOGY

1. CDF Volume Estimate

HDR | LMS calculated the volume of dredged material stored in the CDFs using the most recent topographic surveys for the sites and knowledge of subsequent dredging projects. Using the topographic contours on the site plan as a guide, typical cross-sections of the CDFs were developed and used to calculate the volume of material currently in the CDF. Based on that data, we estimated the volume of material that could be proposed for removal and reuse while still retaining an adequate berm for containment of future dredging projects. A number of site-specific assumptions were used to guide the analyses, and these assumptions are presented below.

- 1.1 Nummy Island

HDR | LMS calculated the volume of dredged material stored in the Nummy Island CDF using the "proposed elevations" on the topographic survey prepared by Hyland Design Group, Inc. We estimate that a volume of 50,000 cubic yards could be removed from the

CDF while still retaining an adequate berm for containment of future dredging projects. Therefore, the sampling plan was developed to characterize approximately 50,000 cy of the material. It is anticipated that the remaining 40,600 cy will remain in the CDF and be recontoured to accommodate future dredging projects.

Detailed calculations are provided in Attachment 1.

- 1.2 Middle Thorofare

The volume estimate of dredged material stored in the Middle Thorofare CDF was calculated using elevation estimates based on the topographic survey map prepared by Gibson Associates, P.A in 1998. Based on a 2004 site visit, it appeared that the survey drawings did not reflect recent dredging projects. We estimated a berm height of 20' and a plateau height of 15' (NGVD). The volume of the material in the plateau section of the CDF was calculated as the surface area multiplied by the depth of excavation. We assumed that the plateau section would be excavated to a depth of 4'. A cross-section of the berm was developed to determine potential excavation volumes (above the road elevation of 9').

In summary, it is estimated that the CDF contains about 39,500 cy of material, of which we intend to remove approximately 35,000 cy. This will allow the berm to be recontoured to an elevation of 15' NGVD, approximately 6' above the roadway.

Detailed calculations are provided in Attachment 1.

- 1.3 Ocean City Site 83

HDR | LMS estimated the volume of dredged material contained in Site 83 using the existing conditions from the most recent topographic survey obtained from the Department of Public Works Engineering & Construction division of the City of Ocean City. The volume of the material in the plateau section of the CDF was calculated as the surface area multiplied by the depth of excavation. We assumed that the depth of the CDF following excavation (4') would be slightly higher in elevation than the depth of the existing marshes (3.9'). A cross-section of the berm was developed to determine potential excavation volumes.

In summary, it is estimated that the CDF currently contains approximately 395,000 cy of material, of which we propose to remove about 375,000 cy. Approximately 20,000 cy of material will be recontoured to accommodate future dredging projects.

Detailed calculations are provided in Attachment 1.

- 1.4 Corps Cell D

Volume estimates for the Corps Cell D CDF in Cape May, NJ were based on the most recent topographic survey drawings that were prepared by the U.S. Army Corps of Engineers Philadelphia District. The volume of the material in the plateau section of the CDF was calculated as the surface area multiplied by the depth of excavation. The surface area for the plateau section of the CDF was estimated using the digital copy of the drawing and AutoCad. It was estimated that the CDF could be excavated to 5' before encountering virgin materials. Because there are two distinct cells in the CDF, the volume of the western side of the CDF was calculated separately from that of the eastern side. Cross sections of the eastern and western berm areas were developed to estimate the volume of dredged material in the berms, and potential removal volumes.

It is estimated that the CDF contains 969,500 cy of dredged material; three-fourths of this material is located in the western cell. Approximately 856,000 cy of material could be removed while leaving sufficient material to recontour the berms to accommodate future dredging projects.

Detailed calculations are provided in Attachment 1.

- 1.5 Waackaack Creek

HDR | LMS calculated the volume of dredged material stored in the Waackaack Creek CDF using elevation estimates based on the topographic survey map prepared by State of New Jersey, Department of Environmental Protection, Division of Engineering and Construction, Bureau of Coastal Engineering (NJDEP BCE). The drawings indicate that there is no existing containment berm on the CDF. There is however an earthen flood control dune that would remain in place following excavation.

It is estimated that the CDF contains about 132,000 cy of material, of which we estimate 47,000 cy will be removed. The remaining 85,000 cy of material will be contoured to

reestablish the flood control dune and to establish a containment berm for future dredging projects.

Detailed calculations are provided in Attachment 1.

2. Number and Location of Cores

Table 1 below shows the proposed excavation volumes for each CDF, the number of cores required to characterize the material as described in *The Management and Regulation of Dredging Activities and Dredged Material in New Jersey's Tidal Waters* (October 1997).

Table 1 – Number of sediment cores recommended for the five CDFs, based on NJDEP guidance manual

CDF	**Excavation Volume (cy)**	**# Cores based on Guidelines**	
Nummy Island	50,000	1/8000 cy	6
Corps Cell D	856,000	1/8000 cy	107
Middle Thorofare	35,000	1/8000 cy	4
Ocean City Site 83	375,000	1/8000 cy	47
Waackaack Creek	47,000	1/4000 cy	12

HDR | LMS developed a sample location plan that would characterize the material that would be removed from the CDFs. The sampling locations were selected using the site plans and volume calculations. Sample locations were selected to characterize the material proposed for removal, based on location within the CDFs. For sites where the majority of material is contained in the containment berms, more cores will be taken from the berms than the plateau areas. Two of the sites (Corps Cell D and Waackaack Creek) have more than one cell. The volume contained in each cell was calculated, and the number of cores to be taken from each cell will correspond to the estimated volume. Table 2 below provides the basis for selecting the location of cores within the CDFs. The site plans for all of the CDFs with the proposed core locations are provided in Attachment 2.

As we discussed, fine-grained particles have a tendency to settle close to the weir structures in CDFs. For this reason, additional sediment cores will be taken near the weir structure.

Please note that conditions in the field may slightly alter the location of the borings. Equipment and safety concerns may require that the cores be taken from alternate regions in the CDFs. However, the field crew will select alternate core locations with the same elevation and general location of the proposed sampling locations. The final sampling locations (NJ State plane coordinates and NGVD 1988 elevation datum) will be provided to your office following the surveys. Each core will be assigned a separate number, and each composit sample will be assigned a letter.

Table 2. Proposed sampling locations and number of cores taken from the five CDFs.

CDF Location	**Section**	**% of Total Material**	**# Cores Based on Guidelines**	**# Cores Proposed**
Nummy Island – Stone Harbor	Berm	91%	5	5
	Plateau	9%	1	1
	Total # Cores		*6*	6
Corps Cell D – Cape May	Plateau East	18%	18	10
	Plateau West	55%	58	29
	Berm East	11%	12	6
	Berm West	19%	20	9
	Total # Cores		*107*	54
Middle Thorofare – Cape May	Plateau	64%	3	2
	Berm	36%	1	1
	Total # Cores		*4*	3
Ocean City Site #83	Plateau	81%	36	19
	Berm	19%	9	5
	Total # Cores		*47*	24
Waackaack Creek – Keansburg	Plateau – Areas A&B	58%	16	7
	Plateau – Area C	42%	12	5
	Total # Cores		*12*	12

3. Sediment Analytical Procedures

The physical and chemical characteristics of the dredged material will be determined in an analytical laboratory. The sediment cores will be delivered whole to the Aqua Survey, Inc. laboratory for analysis. The following sections describe the testing and composting protocols that are proposed for the materials stored in the CDFs.

- 3.1 Grain Size Analysis

The sediment cores will be evaluated for the presence of distinct strata where the sediment characteristics are distinctly different than other layers within the core. Photographs of the cores will be provided to your office with the results of the analytical tests. The determination of the presence of strata will performed by Aqua Survey, Inc. and will be based upon the color, odor, and texture of the sediments. For each stratum greater than two (2) feet in depth within each core, grain size analysis will be performed in the Aqua Survey, Inc. laboratory on one sample using the methods described by R.L. Folk (1980). The results of the grain size analyses will be used to guide the level of effort for the remaining analytical procedures.

If a sample's grain size is determined to be 90% or greater sand content, no further testing will be performed. It is anticipated that the majority of the samples will require further characterization.

- 3.2 Sample Compositing

Composite samples will be prepared for sediments with similar physical properties. For cores where there is no stratification, one composite sample will be prepared from a maximum of three (3) cores. For cores where distinct strata greater than 2 feet in depth exist, composite samples will be prepared for each stratum from a maximum of three (3) cores with similar physical properties.

- 3.3 Chemical Parameters

The bulk sediment chemistry analysis on the composite samples will include the target analytes found in the NJDEP's Soil Cleanup Criteria (PP+40 list) and those found in Attachment 1 of New Jersey's 1997 Dredging Manual. Composite samples will be analyzed for the following parameters:

i. Total Organic Carbon
ii. Percent Moisture

iii. Bulk Sediment Chemistry for metals, semi-volatiles, pesticides, and PCBs (total and aroclors)
iv. Synthetic Precipitation Leaching Procedure for metals, semi-volatiles, pesticides and PCBs (total and aroclors)
v. Dioxin analysis (for the Waackaack Creek CDF only)

4. Reporting

The results of the laboratory analysis and field efforts will be submitted to your office. The following information will be provided in the report: location of the cores (NJ State plane coordinates, NGVD 1988 elevations); photographs of individual cores; composit descriptions and justification; and the results of the laboratory analysis.

Attachment 1

Volume Calculations

Nummy Island in the Town of Stone Harbor, NJ

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SUBJECT SAMPLING PLAN + SITE 103
VOLUME ESTIMATES - NUMMY ISLAND COF

I. ESTIMATE EXISTING VOLUME OF MATERIAL WITHIN COF.

STEP 1 - ESTIMATE VOLUME OF BERM BASED ON A TYPICAL SECTION - SINCE BERM IS CIRCULAR, DIVIDE INTO REPRESENTATIVE SECTIONS AND MEASURE TOTAL LENGTH ALONG CENTROID

STEP 2 - ESTIMATE VOLUME OF CENTRAL PLATEAU BY MEASUREMENT OF SURFACE AREA X DEPTH

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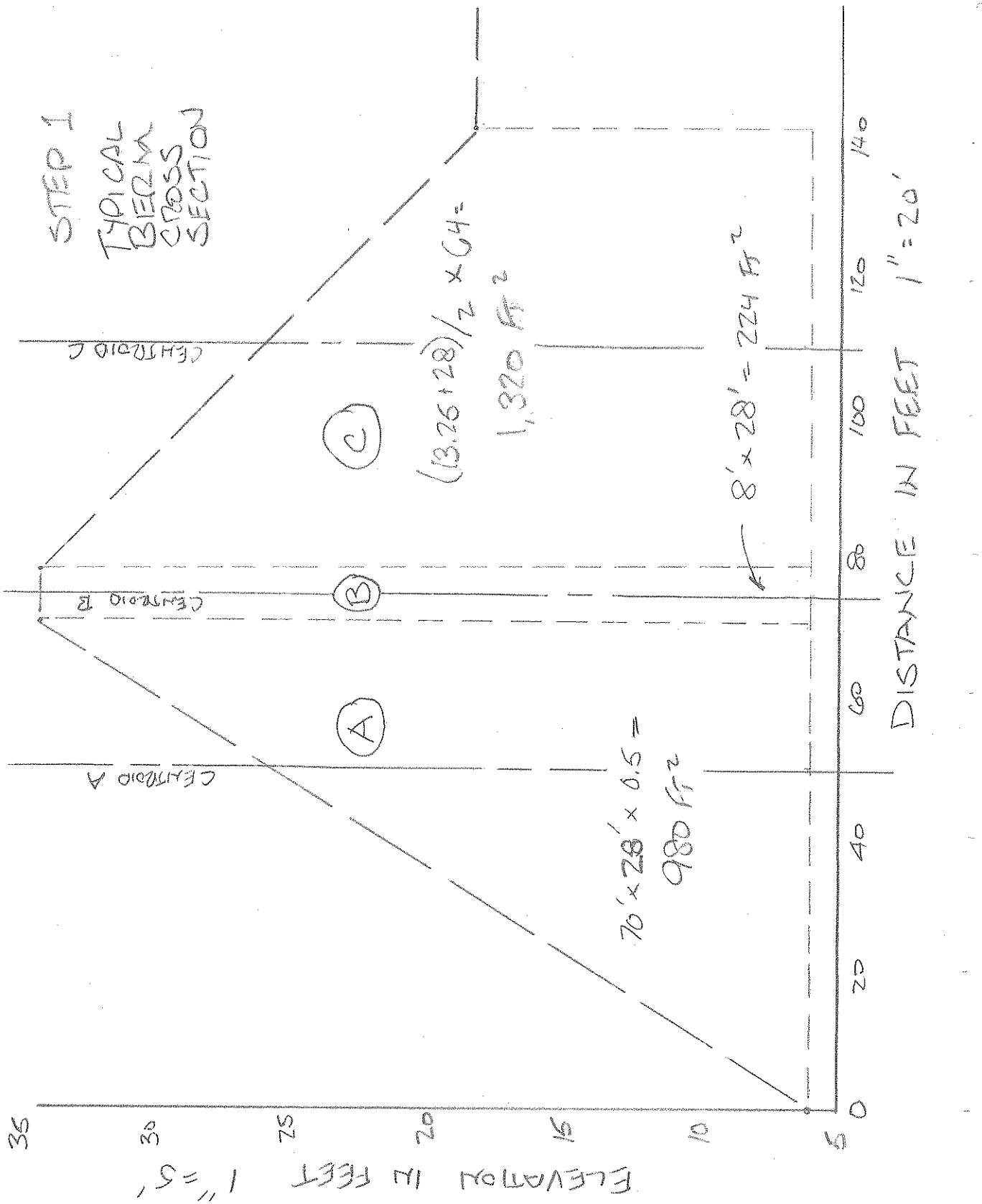
SUBJECT SAMPLING PLAN + SITE 103
VOLUME ESTIMATES — MINELLI ISLAND CDF



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SHEET NO. 3 OF 6

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SUBJECT SAMPLING PLAN + SITE 103
VOLUME ESTIMATE - NUMMY ISLAND COF

(1) VOLUME OF BERM ABOVE EL. 5

DISTANCE ALONG CENTROID A = 1,120 FEET
" " " B = 940 FEET
" " " C = 700 FEET

(AS MEASURED IN PLAN VIEW)

VOLUME SECTION A = $980\ FT^2 \times 1,120\ FT = 1,097,600\ FT^3$
VOLUME SECTION B = $224\ FT^2 \times 940\ FT = 210,500\ FT^3$
VOLUME SECTION C = $1,320\ FT^2 \times 700\ FT = 924,000\ FT^3$

TOTAL $2,232,160\ FT^3$
82,700 CYDS

(2) VOLUME OF INTERIOR PLATEAU

APPROX. TRAPEZOIDAL AREA

$(80 + 150)/2 \times 140 = 16,100\ FT^2$

DEPTH = 18.25 - 5 = 13.25

VOLUME = $16,100\ FT^2 \times 13.25 = 213,325\ FT^3$

7,900 CYDS

(3) TOTAL VOLUME IN COF

82,700 + 7,900 = 90,600 CYDS

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SUBJECT SAMPLING PLAN + SITE 103
VOLUME ESTIMATES – NUMANN ISLAND

II ESTIMATE AMOUNT OF MATERIAL TO BE REMOVED

ASSUME:

- INTERIOR PLATEAU TO BE LOWERED TO ELEVATION 5
- ASSUME OUTSIDE BERM TO BE LOWERED TO ELEVATION 20, 15 FEET ABOVE INTERIOR PLATEAU

AREA OF BERM TO REMAIN = 900 FT^2 (SEE PAGE 5)

APPROX LENGTH OF BERM TO REMAIN MEASURED ON PLAN VIEW = 1,200 F

VOLUME OF BERM TO REMAIN

900 FT^2 x 1,200 FT = 1,080,000 FT^3

40,000 CYDS

VOLUME TO BE REMOVED

EXISTING VOLUME 90,600 CYDS (Pg 3)

VOLUME TO REMAIN 40,000 CYDS

SAY 50,000 CYDS

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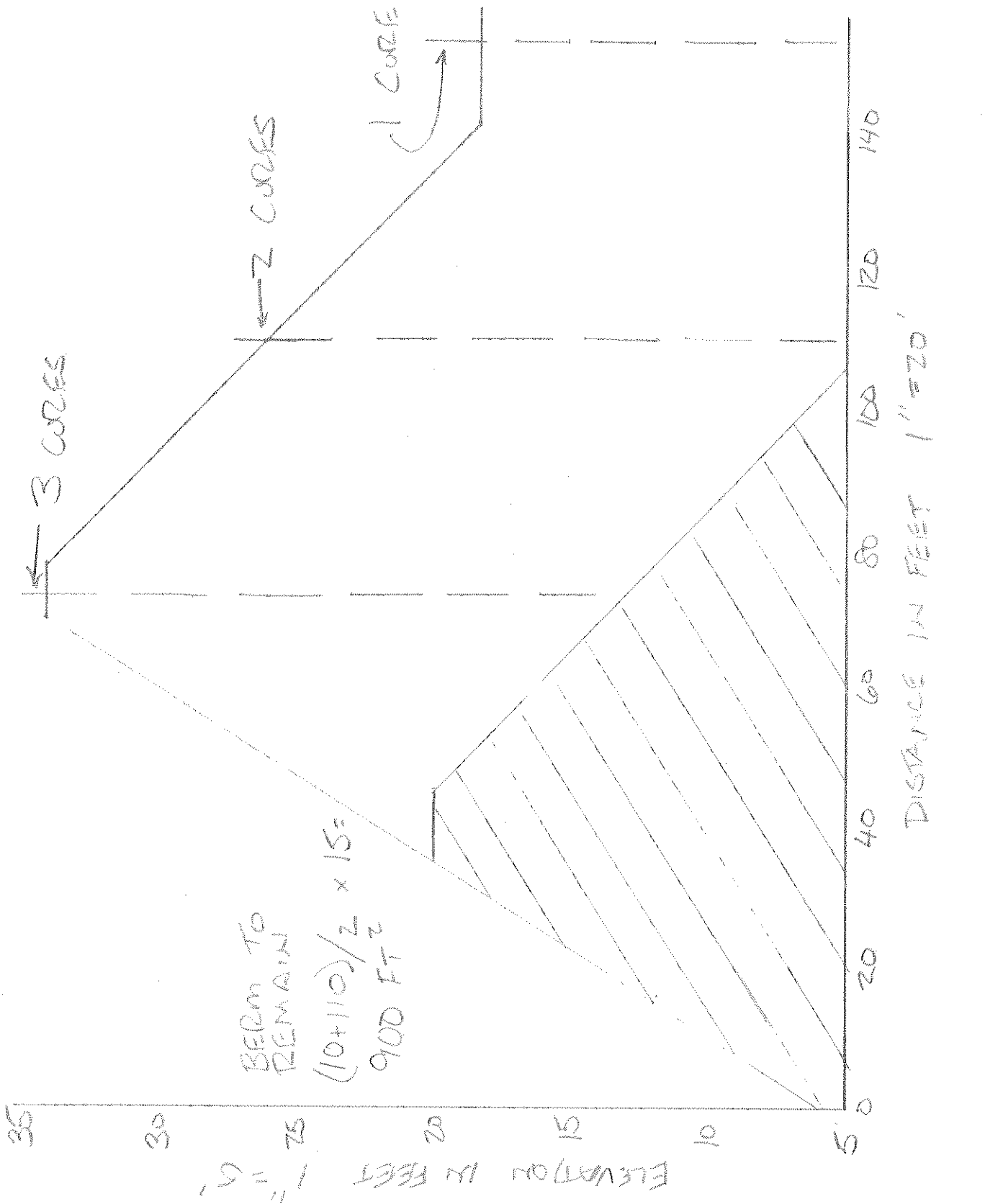
SUBJECT SAMPLING PLAN — SITE 103
VOLUME ESTIMATES - NUMMY ISLAND



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SUBJECT SAMPLING PLAN & VOLUME ESTIMATE — SITE 103 NUMMY ISLAND

THE NJDEP MANUAL ON "THE MANAGEMENT OF DREDGING ACTIVITIES AND DREDGED MATERIAL IN NEW JERSEY TIDAL WATERS" REQUIRES PRE-DREDGING SAMPLING OF MATERIALS TO BE DREDGED. WITHIN REGION 2 - 1 CORE / 8,000 CYDS IS RECOMMENDED. BASED ON THIS SAMPLING RATE, WE RECOMMEND THAT 50,000 CYDS / 8,000 CYDS = 6 CORES BE TAKEN TO REPRESENT THE MATERIAL PROPOSED FOR REMOVAL FROM NUMMY ISLAND.

PROPOSED CORE LOCATIONS:

MAJORITY OF MATERIAL TO BE REMOVED IS WITHIN BERM. THEREFORE, SAMPLING IS PROPOSED AS FOLLOWS

- 3 CORES FROM BERM PLATEAU TO 20 FT DEPTH
- 2 CORES IN INTERIOR SIDESLOPE OF BERM TO 20 FT DEPTH
- 1 CORE IN INTERIOR PLATEAU

(SEE FIG 5 + PLAN SHEET)

Middle Thorofare in Cape May, NJ

BY JLC DATE 10/20/05

CHKD. BY AGM DATE 12/12/05

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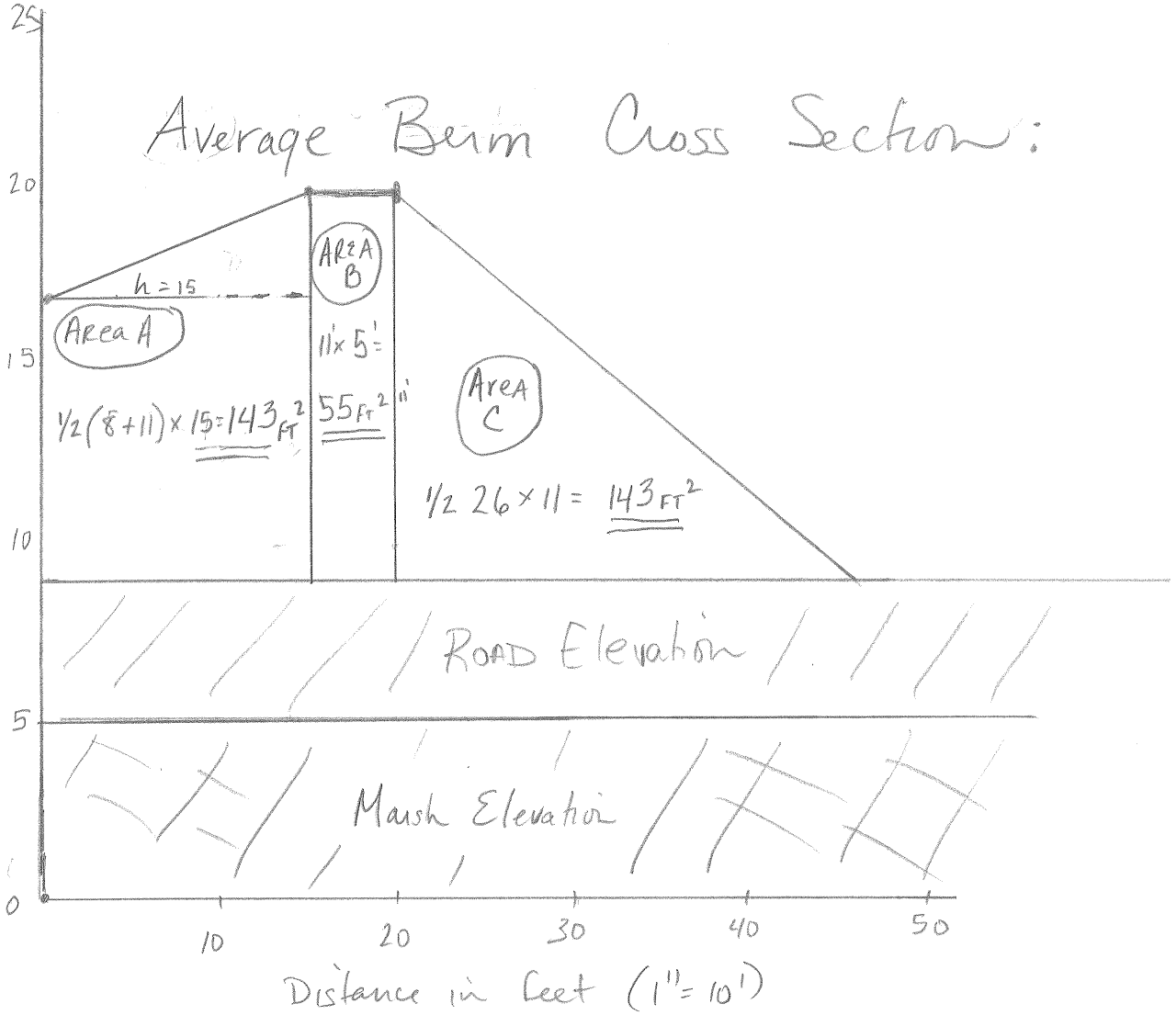
JOB NO.

SUBJECT Middle Thoroughfare CDF
Volume Estimate For Berm



Area of Berm = 143 + 55 + 143 = 341 FT^2

x Length of Perimeter (1,135 FT) =

Volume of Berm = 387,035 FT^3

TOTAL Volume of CDF = Plateau - 681,868 FT^3 64%
Berm - 387,035 FT^3 36%

= 39,561 cy

1,068,903 FT^3

BY LLC DATE 10/11/05
CHKD. BY WGM DATE 10/12/05

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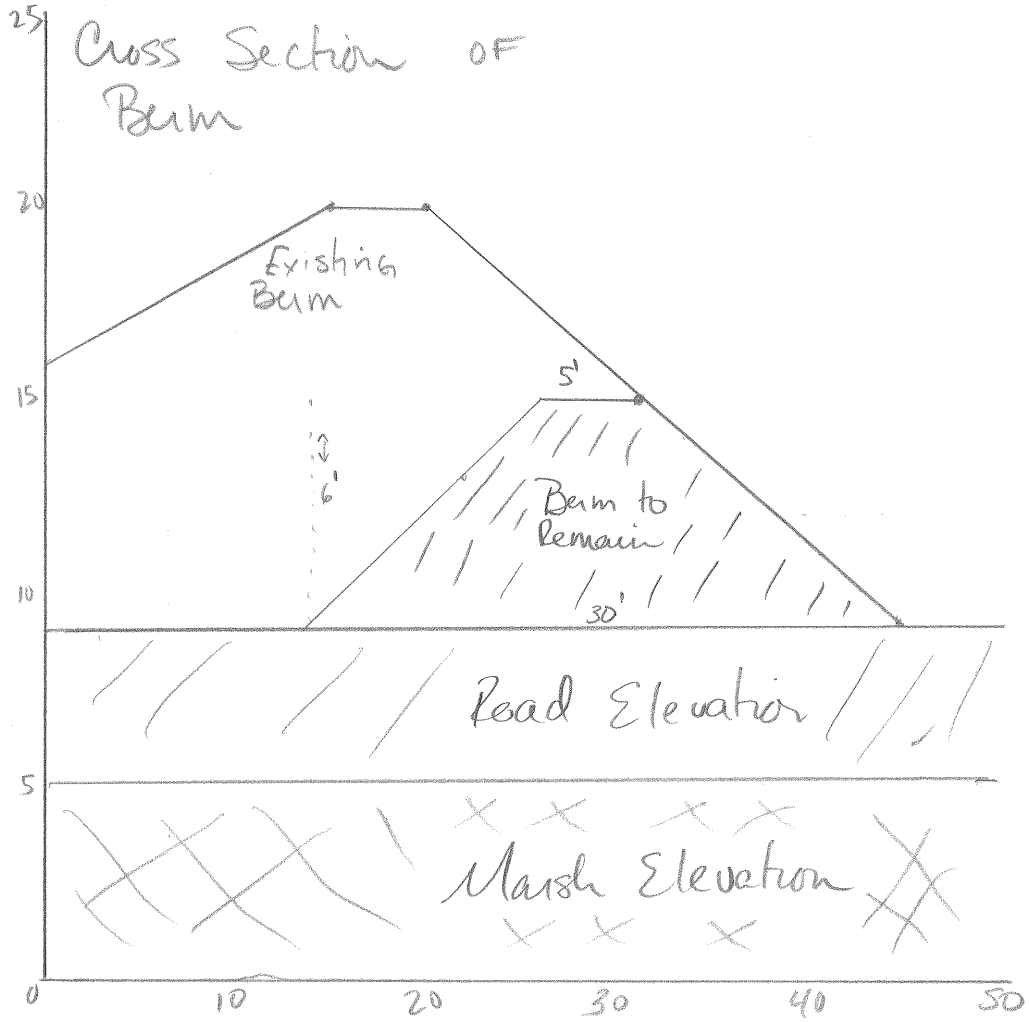
SUBJECT Middle Thorofare CDF - Volume Estimate



Area of Berm to Remain = $(5'+30')/2 \times 6' = 105_{FT^2}$

Volume of Remaining Berm = $105_{FT^2} \times 1,135_{FT} = 119,175_{FT^3}$

Volume to be excavated = $1,068,903_{FT^3} - 119,175_{FT^3}$

$= 949,728_{FT^3}$

$= 35,175$ cy

@ 8000 cy/core → 4 Cores

Site 83 in Ocean City, NJ

BY JLC DATE 10/10/05
CHKD. BY NGM DATE 10/18/05

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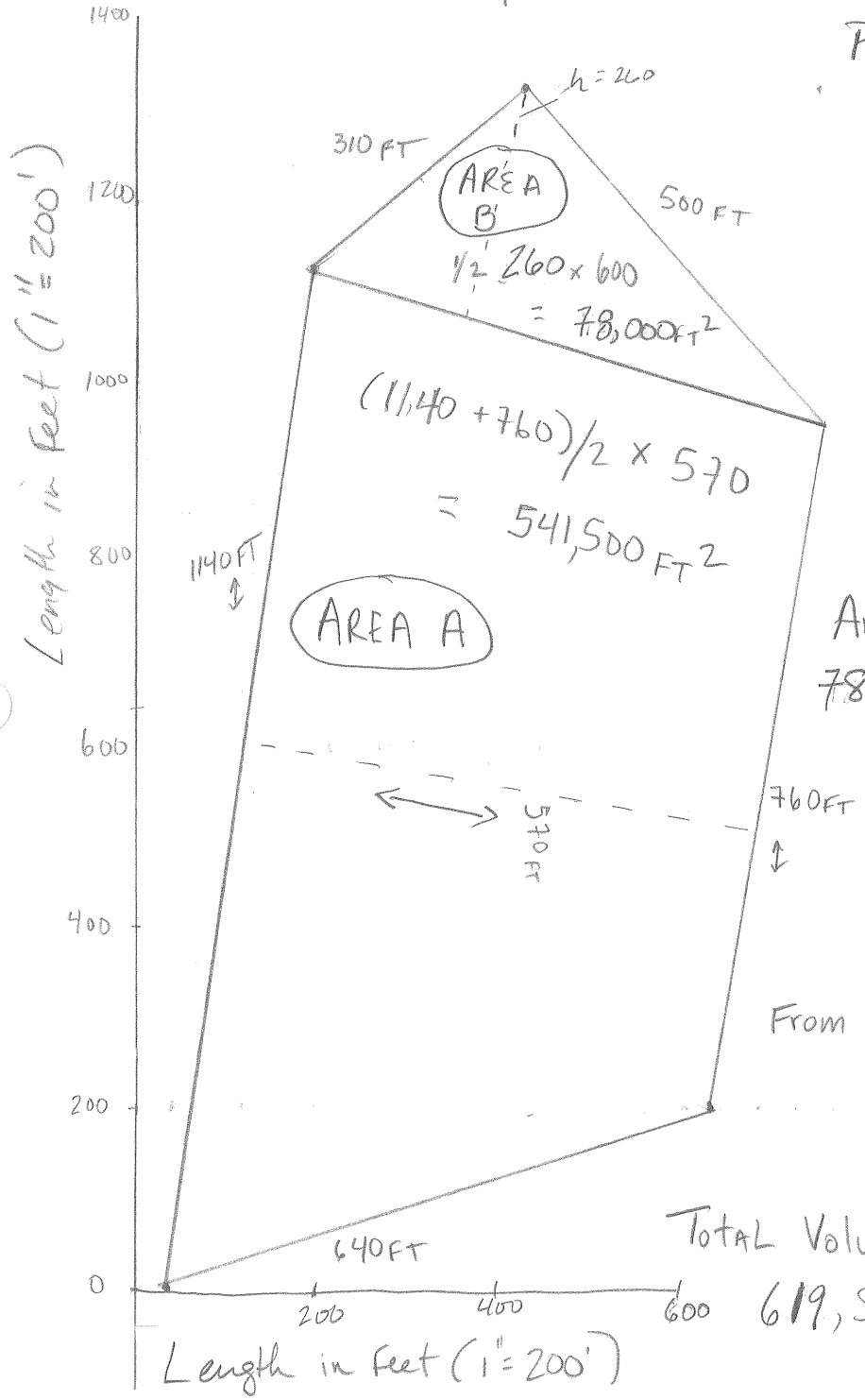
SHEET NO. 1 OF 3
JOB NO. 904-007

SUBJECT Ocean City Site 83 CDF Volume Calculation

PLAN VIEW OF CDF Plateau

North



Area A + Area B = Area
78,000 + 541,500 = 619,500 FT²

From Plan - Marsh el = 3.9' MLW
- Post Pump Avg el = 18.'

Excavation Depth = 18 - 4 = 14 FT

TOTAL Volume of Plateau =
619,500 FT² x 14.0 FT =
8,673,000 FT³

Perimeter = 3,350 FT

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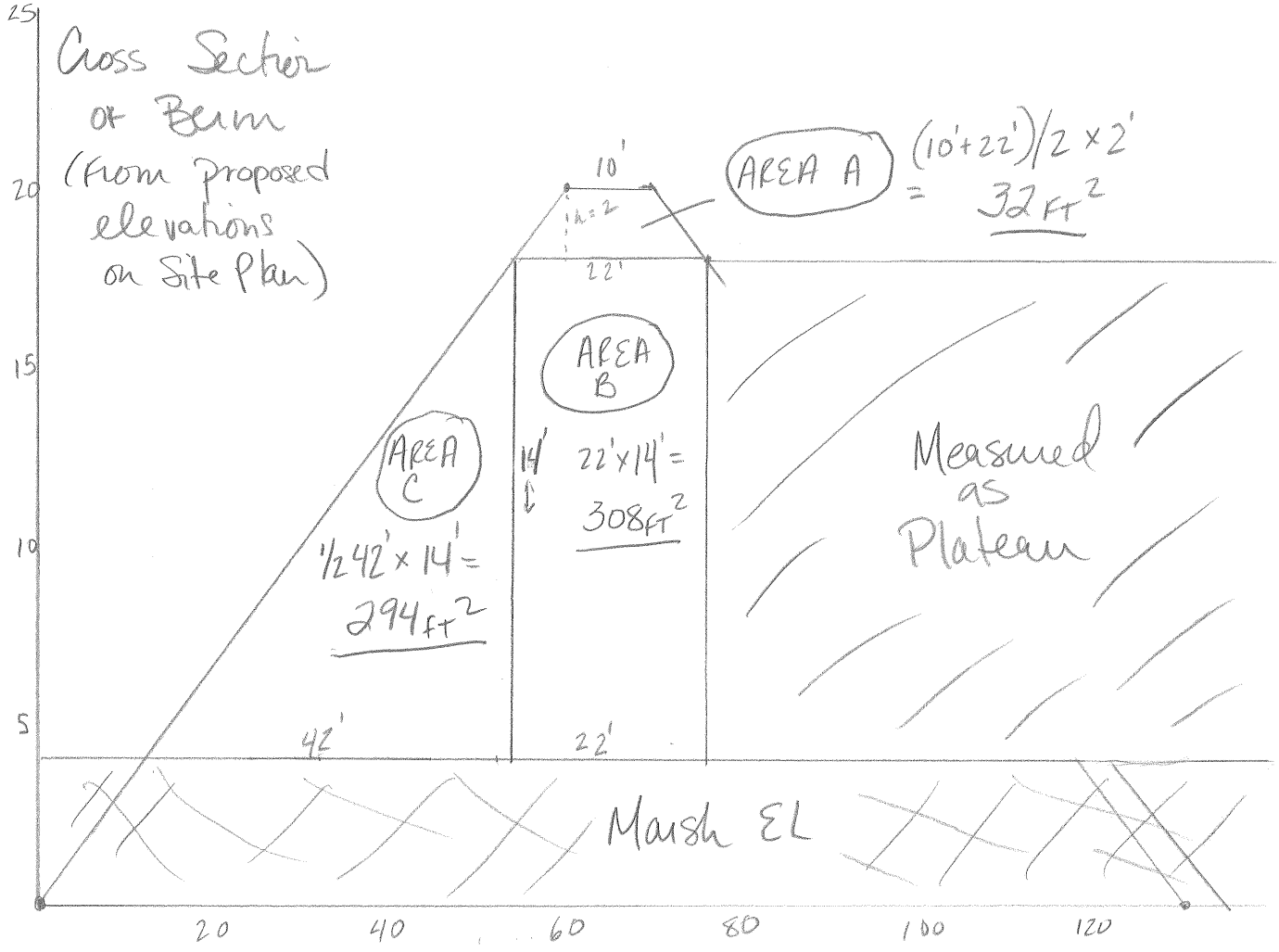
SUBJECT Ocean City Site 83 CDF Volume Estimate



Area of Berm = 634 FT^2

x Perimeter of Plateau (3,350 FT)

= Volume of Berm = 2,123,900 FT^3

Total CDF Volume =	Plateau -	9,292,500 FT^3	81%
	Berm -	2,123,900 FT^3	19%
	Total =	11,416,400 FT^3	

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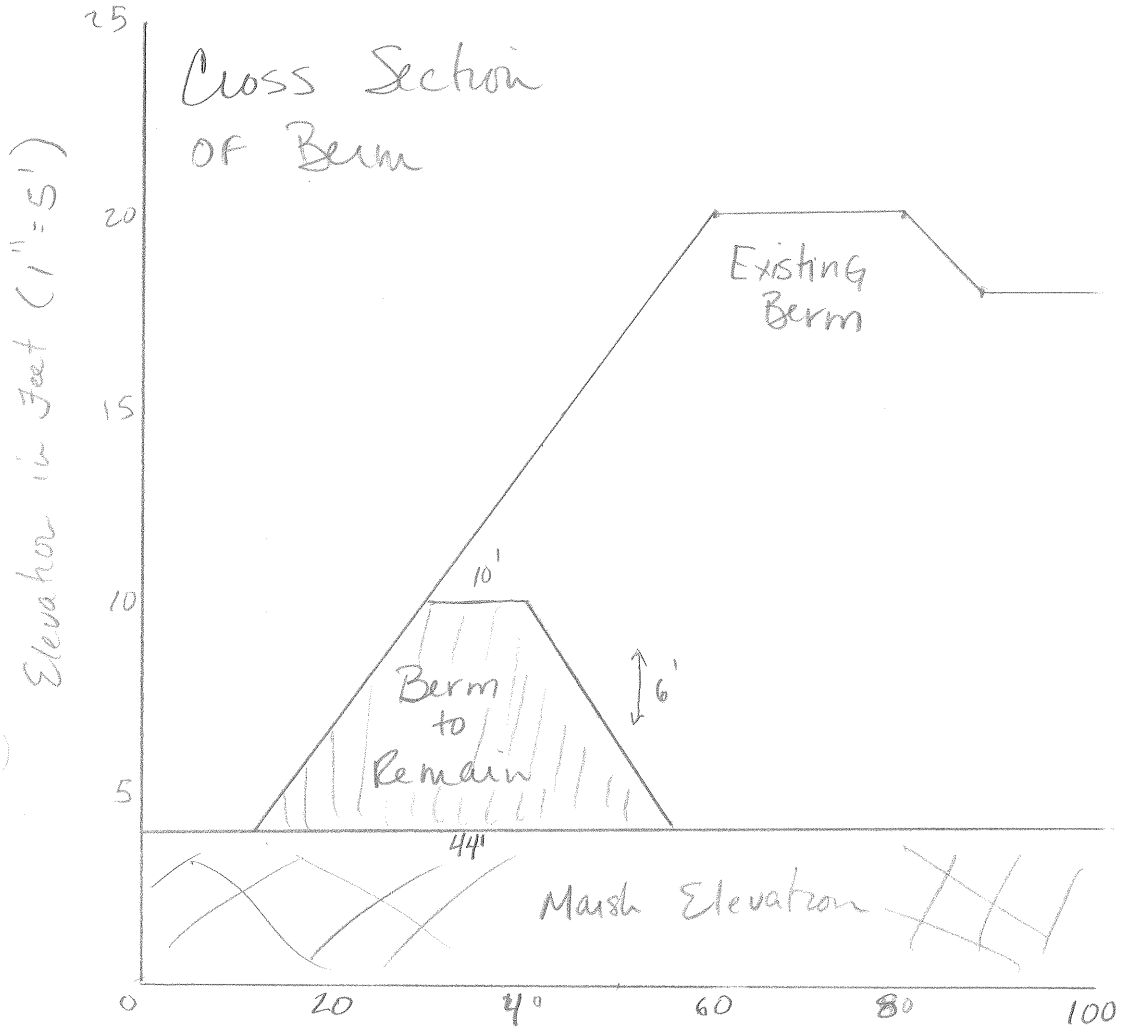
SUBJECT Ocean City Site 83 CDF - Volume Estimate



Area of Berm to Remain = $(10'+44')/2 \times 6' = 162 FT^2$

Volume of Remaining Berm = $162 FT^2 \times 3,350 FT = 542,700 FT^3$

Volume to be excavated = $10,662,450 FT^3 - 542,700 FT^3$

$= 10,119,750 FT^3$

$= 374,806$ cy

@ 8,000 cy/Core → 47 cores

Corps Site D in Cape May, NJ

BY JC DATE 10/10/05
CHKD. BY WLM DATE 10/18/05

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SHEET NO. 1 OF 4
JOB NO. 904-007

SUBJECT Corps Site D - Cape May, NJ Volume Estimate

(1) Area of Plateau - From AutoCad

Western Side - 596,098 FT^2
Eastern Side - 275,722 FT^2

A Western Side - Avg El. ≈ 29. FT
Assume CDF will be excavated to 5' → Excavation Depth = 24. FT

Volume of Western Side ≈ 14,306,352 FT^3
Perimeter of Western Plateau = 3,498 FT (from AutoCad)

B. Eastern Side - Avg El. ≈ 19. FT
Excavation Depth ≈ 14 FT

Volume of Eastern Side ≈ 3,860,108 FT^3

Total Volume of Plateau ≈ 18,166,460 FT^3

Perimeter of Eastern Plateau = 2,245 FT (from AutoCad)

* Note Berm Separating Western & Eastern Cells Not included in Volume Estimate

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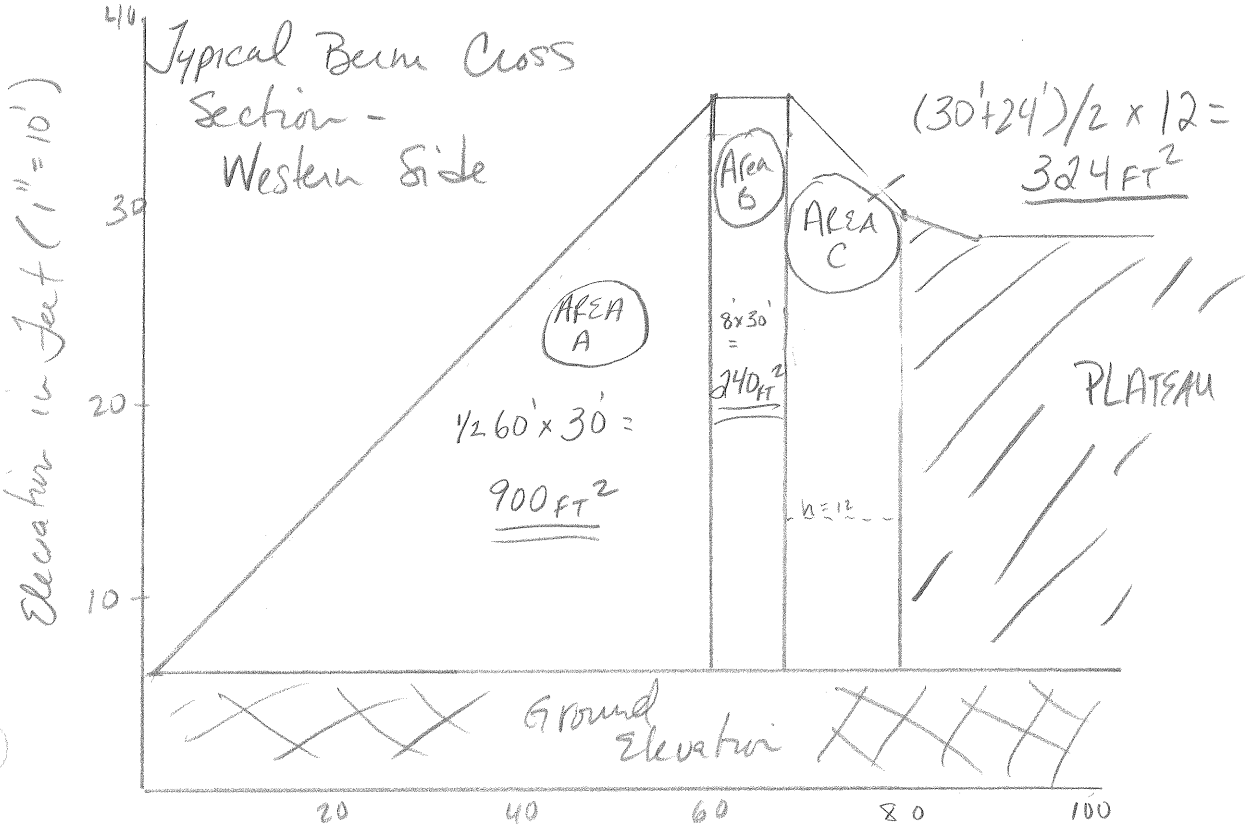
SUBJECT Corps Site D, Cape May NJ - Volume Calculations



TOTAL Area Western Berm = 1,464 FT²

X Perimeter of Western Plateau (3,498 FT) =

5,121,072 FT³

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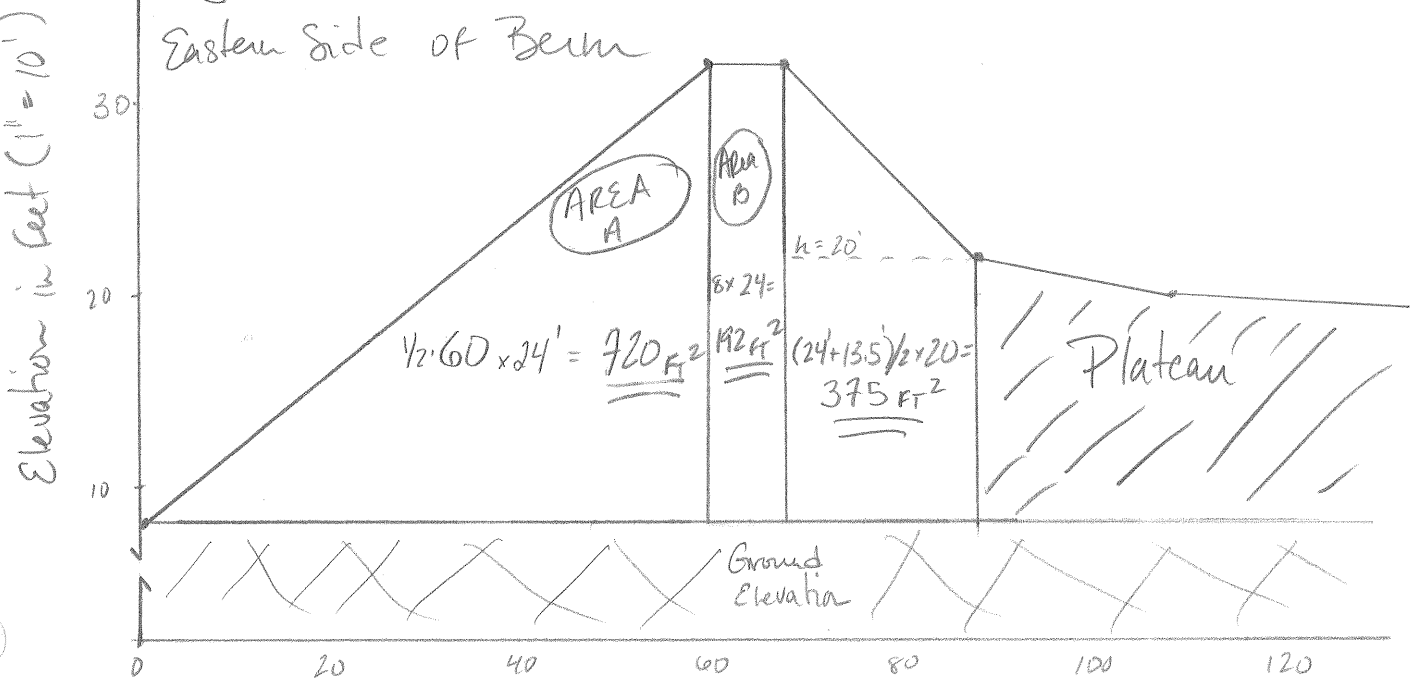
SUBJECT Corps Site D - Volume Calculation

Typical Cross Section for Eastern Side of Berm



TOTAL AREA - Eastern Portion of Berm = 1,287 FT²

x Perimeter of E. Portion of Plateau (2,245 FT) =

Total Volume of E. Portion of Berm ≈ 2,889,315 FT³

Total CDF Volume

i	Plateau - EAST	3,860,108 FT³	15% of Total
ii	Plateau - West	14,306,352 FT³	55% of Total
iii	Berm - East	2,889,315 FT³	11% of Total
iv	Berm - West	5,121,072 FT³	19% of Total

26,176,847 FT³

= 969,513 cy

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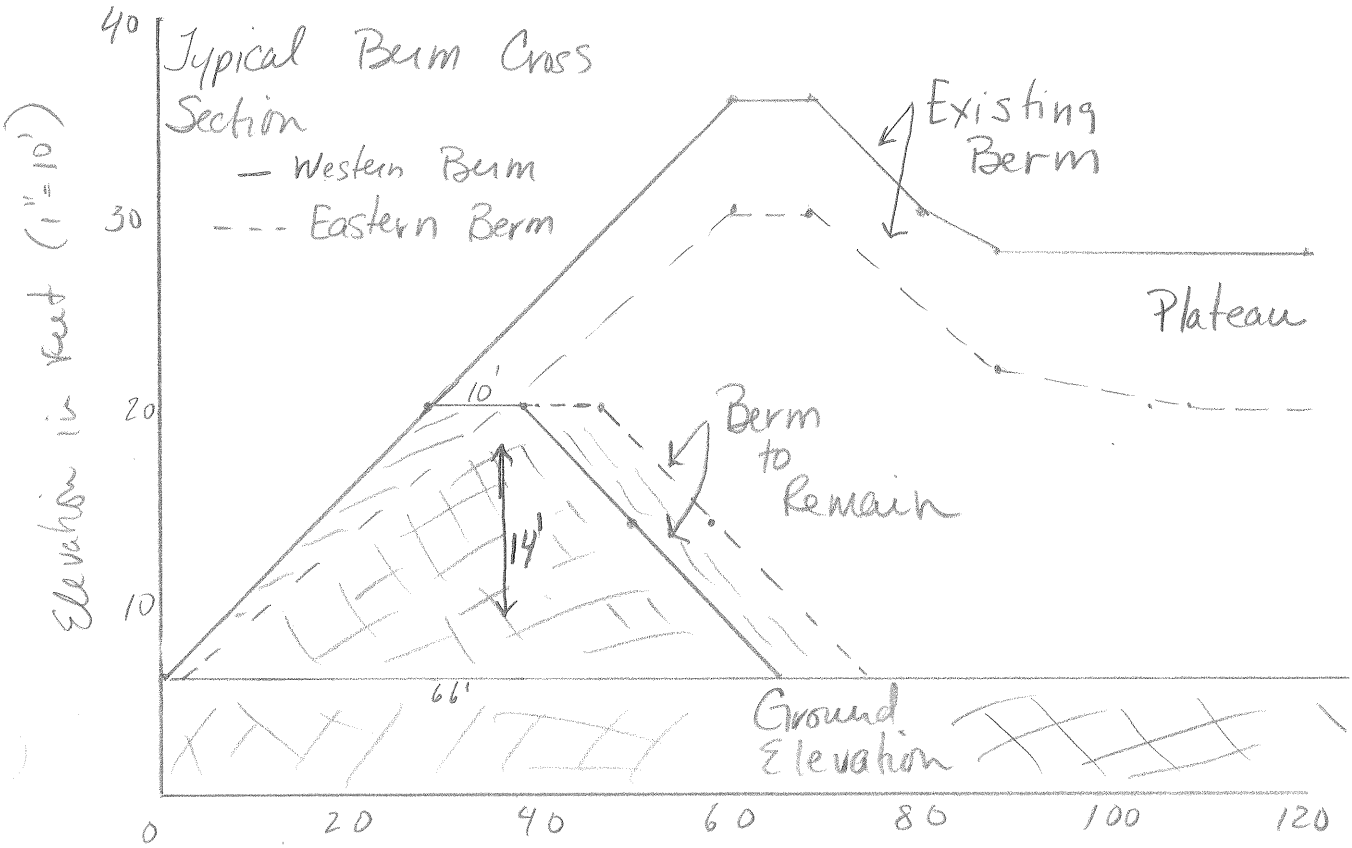
SUBJECT Corps Site D - Volume Calculations



- Area of Remaining Berm = (66' + 10')/2 × 14' = 532 FT^2

- Volume of Remaining Berm =

1. Western Berm - 532 FT^2 × 3,498 FT = 1,860,936 FT^3
2. Eastern Berm - 532 FT^2 × 2,245 FT = 1,194,340 FT^3

Total Berm Volume = 3,055,276 FT^3

Total CDF Volume = 26,176,847 FT^3
− Vol. of Remaining Berm = 3,055,276 FT^3
= Total Vol. to Excavate = 23,121,571 FT^3
= 856,354 cy

1 core/8,000 = 107 cores

Waackaack Creek in Keansburg, NJ

BY JLC DATE 10/13/05
CHKD. BY NGM DATE 10/18/05

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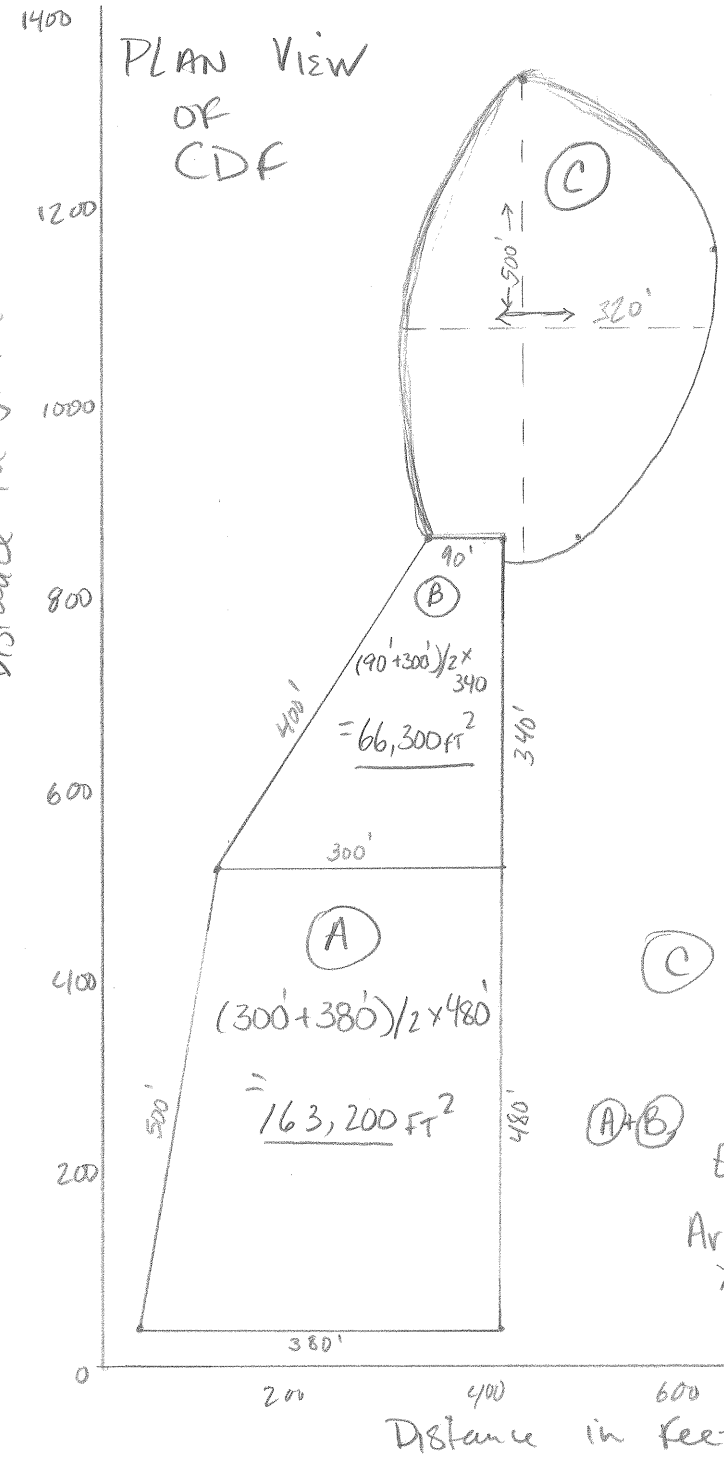
JOB NO.

SUBJECT WAACKAACK CREEK - CDF Volume Estimate



"Existing Sand Mound" is Approximately the shape of an OVAL. $A = \pi (320'/2)(500'/2)$

$A = 125,663 \text{ FT}^2$

Avg Depth (C) = 21 FT
Assume Depth to Excavation of 9 feet (Above existing Veg. Line)

Excavation Depth = 21' - 9' = 12'

(C) Volume to be excavated = $12 \text{ FT} \times 125,663 \text{ FT}^2 =$
$1,507,956 \text{ FT}^3$

(A+B) Avg. Depth = 18 FT
Excavation Depth = 18' - 9' = 9 FT

Area of (A)+(B) = $229,500 \text{ FT}^2$
× Excavation Depth (9') =
$2,065,500 \text{ FT}^3$

Total Volume to be excavated = $3,573,456 \text{ FT}^3$ - Vol of Berm

* Containment & Flood Control Earthen Berms will remain.
See next pages for Vol. estimates

BY JLC DATE 10/13/05 CHKD. BY WGM DATE 10/18/05

LAWLER, MATUSKY & SKELLY ENGINEERS LLP

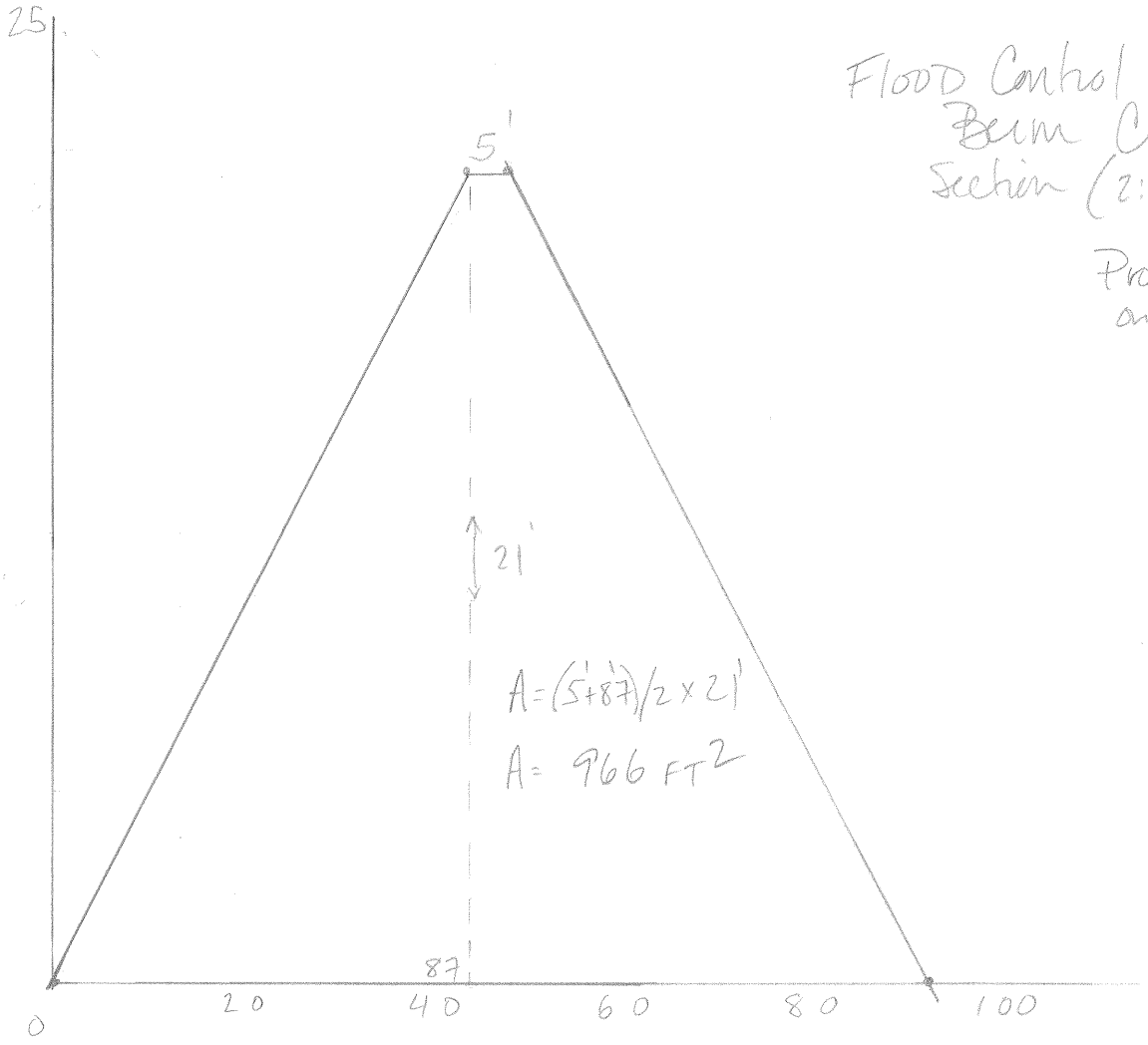
ENVIRONMENTAL SCIENCE & ENGINEERING CONSULTANTS

ONE BLUE HILL PLAZA
POST OFFICE BOX 1509
PEARL RIVER, NEW YORK 10965
845-735-8300

SHEET NO. 2 OF 3

JOB NO.

SUBJECT Wrackaack Creek Volume Estimates



Flood Control Earthen Berm Cross Section (2:1 slope assumed for Proposed Condition on Site Plan

Length of Berm = 555 FT

Area of Berm Cross-Section = 966 FT^2

Volume of Berm to Remain =

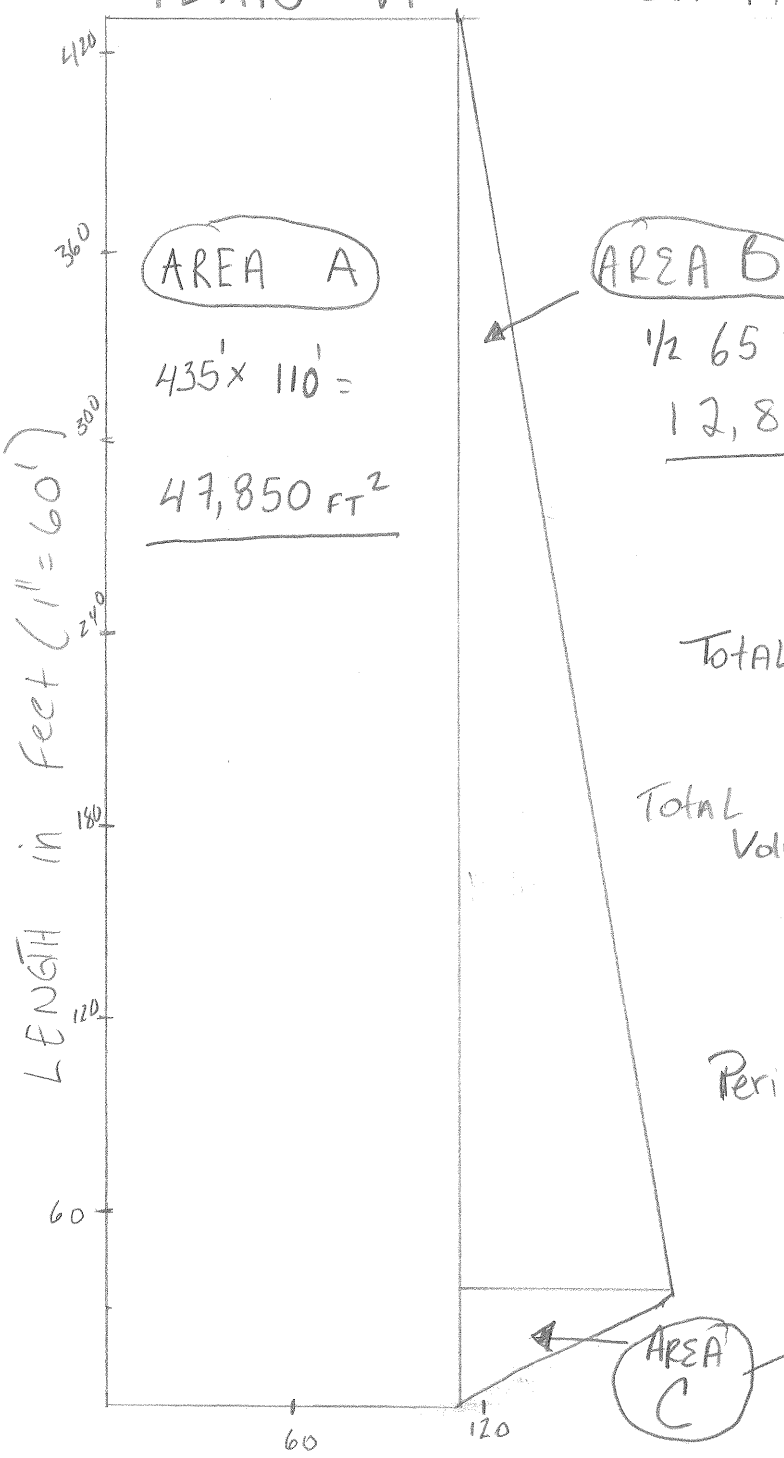
Flood Control Berm = 536,130 FT^3

BY JLC DATE 10/10/05
CHKD. BY WGM DATE 10/12/05

LAWLER, MATUSKY & SKELLY ENGINEERS LLP
ENVIRONMENTAL SCIENCE & ENGINEERING CONSULTANTS
ONE BLUE HILL PLAZA
POST OFFICE BOX 1509
PEARL RIVER, NEW YORK 10965
845-735-8300

SUBJECT Volume Estimate - For Plateau Area on Middle Thorofare CDF

PLAN VIEW OF CDF Plateau



Total Area = (47,850' + 12,838 + 1,300) = 61,988 FT²

Total Volume = 61,988 FT² x 11' = 681,868 FT³

Perimeter = 1,135 FT

Total Volume = (Area A + Area B + Area C) x Excavation Depth (11')
= 681,868 FT³

BY JC DATE 10/18/05 CHKD. BY WGM DATE 10/18/05

LAWLER, MATUSKY & SKELLY ENGINEERS LLP

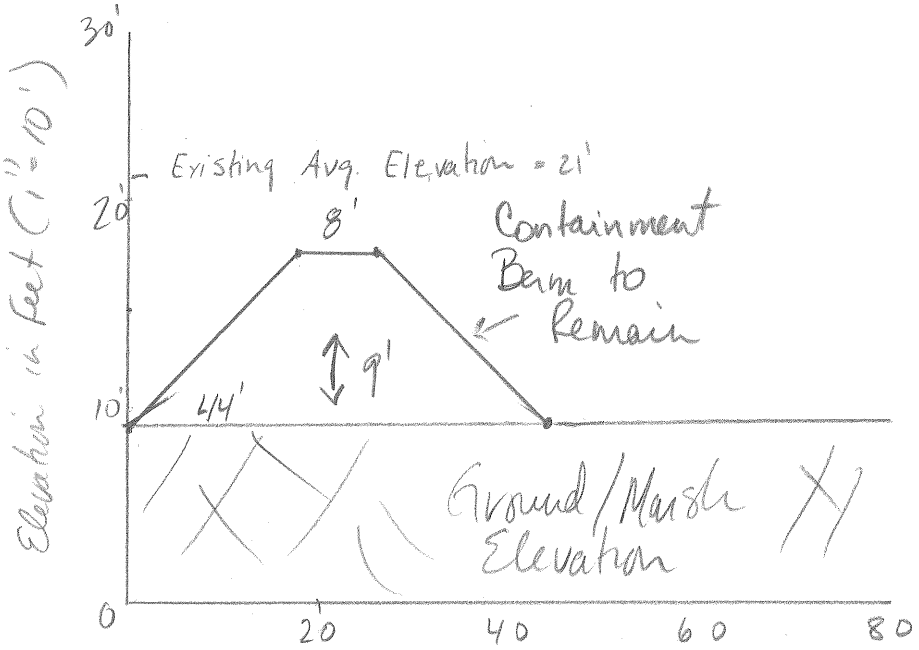
ENVIRONMENTAL SCIENCE & ENGINEERING CONSULTANTS

ONE BLUE HILL PLAZA
POST OFFICE BOX 1509
PEARL RIVER, NEW YORK 10965
845-735-8300

SHEET NO. 3 OF 3

JOB NO.

SUBJECT Waackaack Creek - Volume Estimate



Area of Containment Berm
$= (8+44)/2 \times 9 = 234 \text{ FT}^2$

Circumference of Area (C) Page 1 $= \frac{500 \text{ FT} + 320 \text{ FT}}{2} \times \pi$

$= 5,152 \text{ FT}$

Perimeter of Area (B) page 1 = (400' + 300' + 340') = 1,040 FT

Perimeter of Area (C) page 1 = (500' + 480' + 380') = 1,360 FT

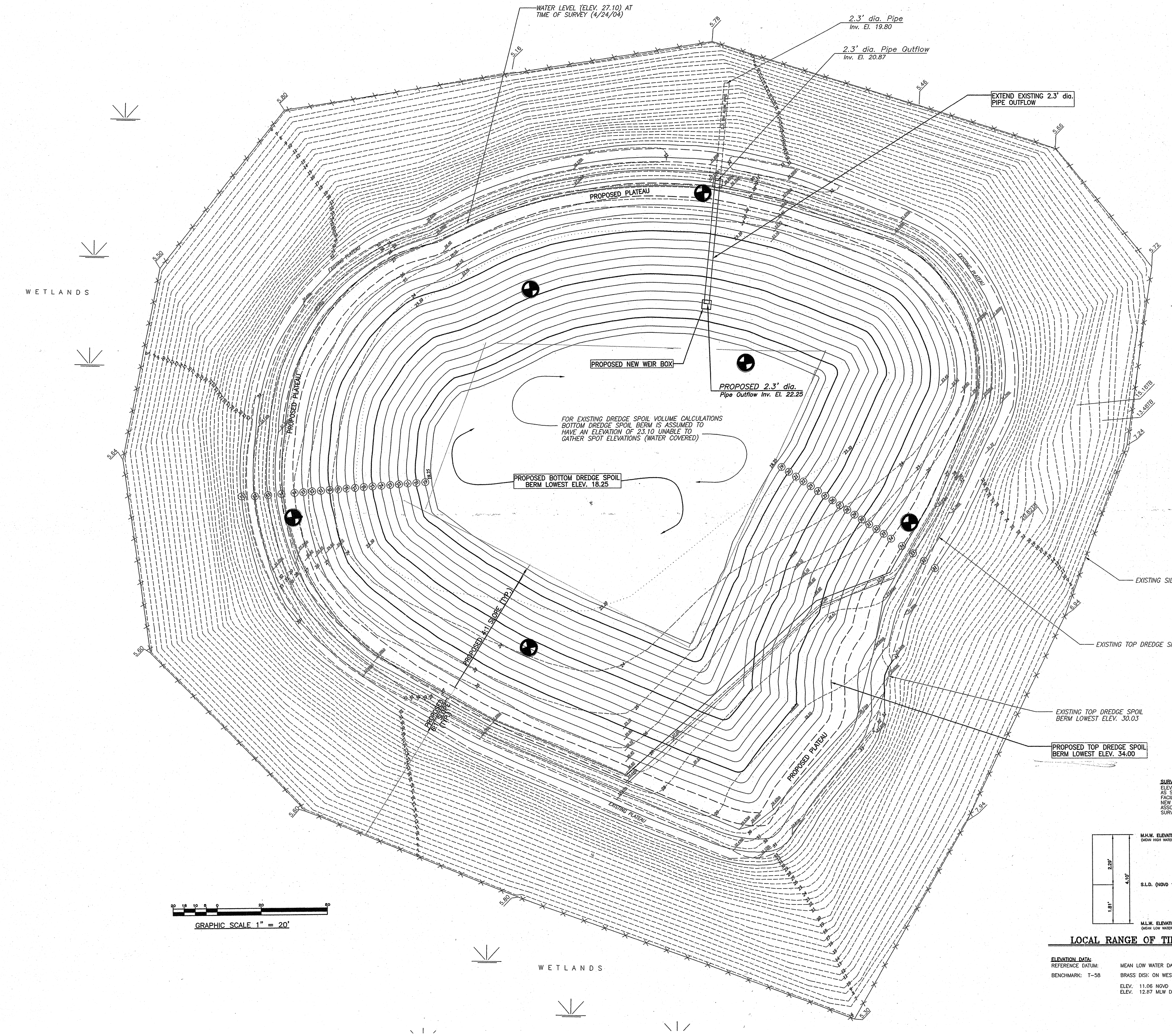
Perimeter of CDF = 7,552 FT
× Area of Containment Berm = 1,767,168 FT³
+ Volume of Flood Control Berm = + 536,130 FT³
= Material to remain 2,303,298 FT³

Total Volume Excavated = 3,573,456 FT³ (from pg 1)
− 2,303,298 FT³
= 1,270,158 FT³ = 47,042 cy
@ 4,000/Core = 12 Cores

Attachment 2

Sample Locations

Nummy Island in the Town of Stone Harbor, NJ



Nummy Island
Stone Harbor, NJ

● PROPOSED SAMPLING LOCATION

CONTAINED DISPOSAL FACILITY SITE 103:
EXISTING AVAILABLE CAPACITIES

TO ELEV. 30.03:	14,530.2 C.Y.	(392,315.9 C.F.)
TO ELEV. 29.03:	11,864.9 C.Y.	(320,352.7 C.F.)
TO ELEV. 28.03:	9,345.0 C.Y.	(252,313.9 C.F.)

CONTAINED DISPOSAL FACILITY SITE 103:
PROPOSED AVAILABLE CAPACITIES

TO ELEV. 34.00:	21,340.4 C.Y.	(576,191.9 C.F.)
TO ELEV. 33.00:	19,136.8 C.Y.	(516,694.8 C.F.)
TO ELEV. 32.00:	17,065.9 C.Y.	(460,779.9 C.F.)

SURVEY NOTE:
ELEVATIONS AND CONDITIONS OUTSIDE OF TOP DREDGE SPOIL BERM LINE AS SHOWN HEREON ARE AS SHOWN ON PLAN "CONTAINED DISPOSAL FACILITY 103, LOT 1, BLOCK 320, MIDDLE TOWNSHIP, CAPE MAY COUNTY, NEW JERSEY", DRAWING No. H-5670, PREPARED BY MICHAEL W. HYLAND ASSOCIATES, P.A., DATED AUGUST 12, 2002, (NOTED ON PLAN AS FIELD SURVEY PERFORMED ON JULY 31, 2002).

M.H.W. ELEVATION 4.10 (MEAN HIGH WATER LINE)
2.29'
4.10'
S.L.D. (NGVD 1929) 1.81
1.81'
M.L.W. ELEVATION 0.00 (MEAN LOW WATER LINE)

LOCAL RANGE OF TIDES

NOT TO SCALE

ELEVATION DATA:
REFERENCE DATUM: MEAN LOW WATER DATUM (LOCAL)
BENCHMARK: T-58 BRASS DISK ON WEST END OF GREAT CHANNEL BRIDGE
ELEV. 11.06 NGVD 1929
ELEV. 12.87 MLW DATUM LOCAL

ELEVATION DATA LEGEND:
EXISTING CONTOUR
PROPOSED CONTOUR
WATER LINE (ELEV. 7.10)
EXISTING ELEVATION
BOTTOM OF BERM
TOP OF BERM
WEIR PLANKS
WATER LEVEL (7.10)

Initially Issued:	May 28, 2004
No. REVISION	BY DATE

HYLAND DESIGN GROUP, Inc.
101 East Eighth Street, Ocean City, New Jersey 08226
Phone: (609) 398-6477 Fax: (609) 398-7366
www.hylanddesigngroup.com
Bd. of Engineers and Surveyors Certificate of Authorization No. 24GA28088700
ENGINEERS ○ ARCHITECTS ○ SURVEYORS ○ PLANNERS ○ ENVIRONMENTAL CONSULTANTS

Michael W. Hyland
N.J.P.E. & L.S. No. 20509
N.J.R.A. No. 09025

MODIFICATIONS TO CONTAINED DISPOSAL FACILITY 103

TAX LOT 1 TAX BLOCK 320
MIDDLE TOWNSHIP, CAPE MAY COUNTY, NEW JERSEY

C.D.F. PROPOSED MODIFICATIONS

PROJECT No.	4361
DRAWN BY	RSS
CHECKED BY	MWH
Field Book / page	889, 62-65
DRAWING SET No.	H-6136
SHEET	2
OF 2 SHEETS	

Middle Thorofare in Cape May, NJ

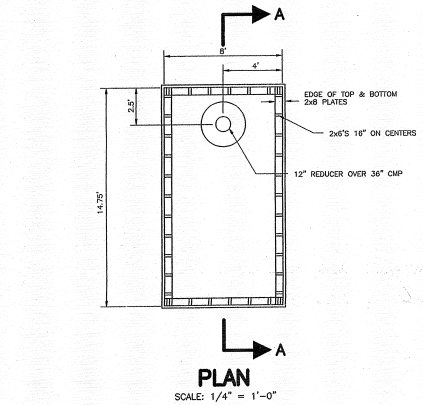
GENERAL NOTES:

1. DREDGE SPOILS TO BE HYDRAULICALLY DREDGED FROM HINCH MARINA ON LOTS 15.04 & 15.05 BLOCK 793, AND DEPOSITED ON EXISTING SPOILS SITE LOCATED ON LOT 15.07 BLOCK 793, LOWER TOWNSHIP, CAPE MAY COUNTY, NEW JERSEY.
2. THE APPLICANT SHALL PROVIDE WRITTEN AUTHORIZATION FROM THE OWNER OF LOT 15.07 BLOCK 793 TO UTILIZE THE PROPOSED DISPOSAL SITE, DREDGE AND INSTALL BULKHEAD AND ANCHORAGE SYSTEM ON A PORTION OF LOT 15.07.
3. ALL DISCHARGE LINES SHALL BE LOCATED AS NOT TO INTERFERE WITH VESSEL ACCESS TO EXISTING DOCKING AND/OR LAUNCHING FACILITIES ON NAVIGATION, AND SHALL BE PROPERLY MARKED.
4. PRIOR TO COMMENCEMENT OF PROPOSED DREDGING OPERATIONS, THE APPLICANT SHALL OBTAIN CERTIFICATION FROM THE CAPE-ATLANTIC SOIL CONSERVATION DISTRICT FOR SOIL EROSION AND SEDIMENT CONTROL PROCEEDURES, AND SHALL ALSO CONTACT THE N.J.D.E.P. BUREAU OF COASTAL AND LAND USE ENFORCEMENT TO FIELD VERIFY THE INTEGRETY OF THE SPOILS DIKE.
5. DREGING DATES TO BE ESTABLISHED BY THE N.J.D.E.P.
6. ALL CONSTRUCTION EQUIPMENT WORKING ON THE WETLANDS SURFACE SHALL BE SUPPORTED ON MATS, AND ANY WETLANDS DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ITS PRE-CONSTRUCTION CONDITION.
7. LIMITS OF EXISTING SPOILS AREA WERE LOCATED IN THE FIELD ON APRIL 30,1998 BY GIBSON ASSOCIATES, P.A.
8. CAPACITY OF EXISTING SPOILS AREA REGRADED IS 13124+/- CUBIC YARDS (CALCULATED USING THE REGRADED BOTTOM ELEVATION OF 10.0 AND THE BERM ELEVATION OF 15.0) THE VOLUME OF PROPOSED SPOILS IS 7838+/- CUBIC YARDS.
9. CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND CONDITIONS AT THE SPOILS SITE PRIOR TO PROCEEDING WITH WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER AND RESOLVED BEFOR PROCEEDING WITH WORK IN QUESTION.
10. ALL TIMBER/LUMBER SHALL BE C.C.A. PRESSURE TREATED IN ACCORDANCE WITH A.W.P.A. C-1 STANDARDS (2.5# MINIMUM TREATMENT OR EQUIVALENT).
11. ALL CUTS AND HOLES MADE IN THE RIGID VINYL SHEET PILES SHALL BE FILLED WITH A WATERPROOF SEALER.
12. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH APPLICABLE CODES AND ORDINANCES, AND IN GOOD CONSTRUCTION PRACTICE.
13. ANY CHANGES, MODIFICATIONS AND/OR SUBSTITUTION OF MATERIALS TO THE BULKHEAD DESIGN AND/OR ANCHORAGE SYSTEM IS SUBJECT TO REVIEW AND APPROVAL BY THE DESIGN ENGINEER.
14. ALL UPLAND DISTURBED AREAS TO BE PERMANENTLY STABILIZED IN ACCORDANCE WITH THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY.
15. ALL HARDWARE SHALL BE HOT DIPPED GALVANIZED.

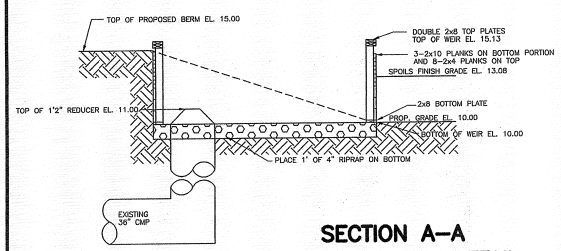
BULKHEAD SPECIFICATION:

PHYSICAL PROPERTY	MINIMUM SPECIFICATION
MATERIAL	RECYCLED VINYL WITH WEATHERABLE VIRGIN CAPSTOCK
DEPTH OF SECTION	7 INCHES
WEIGHT	3.2 POUNDS PER FOOT
WALL THICKNESS	0.25 INCHES
SECTION MODULUS	10.9 IN./FT.
ALLOWABLE MOMENT	2400 FT-POUNDS

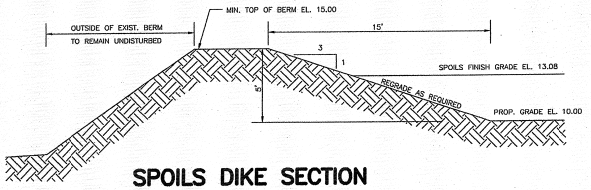
VINYL SHEET PILING SHALL BE EQUIVALENT TO SHOREGAURD SERIES 300 MANUFACTURED BY MATERIALS INTERNATIONAL INC. THE MINIMUM PHYSICAL PROPERTIES SHALL BE AS LISTED ABOVE:



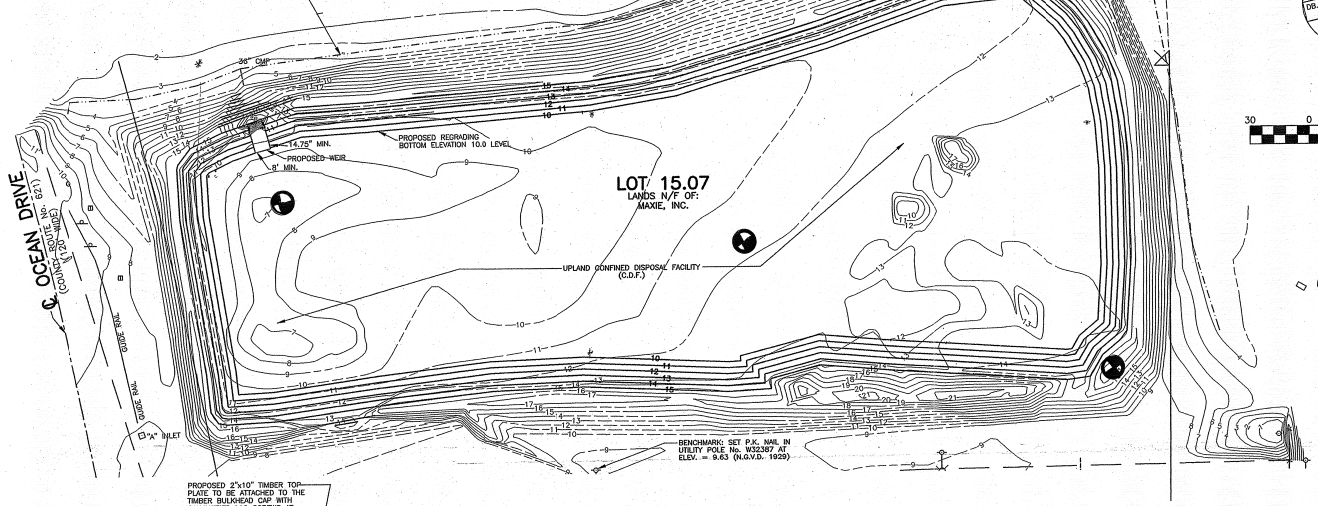
PLAN
SCALE: 1/4" = 1'-0"

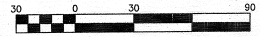


SECTION A-A
OVERFLOW WEIR DETAIL
SCALE: 1/4" = 1'-0"



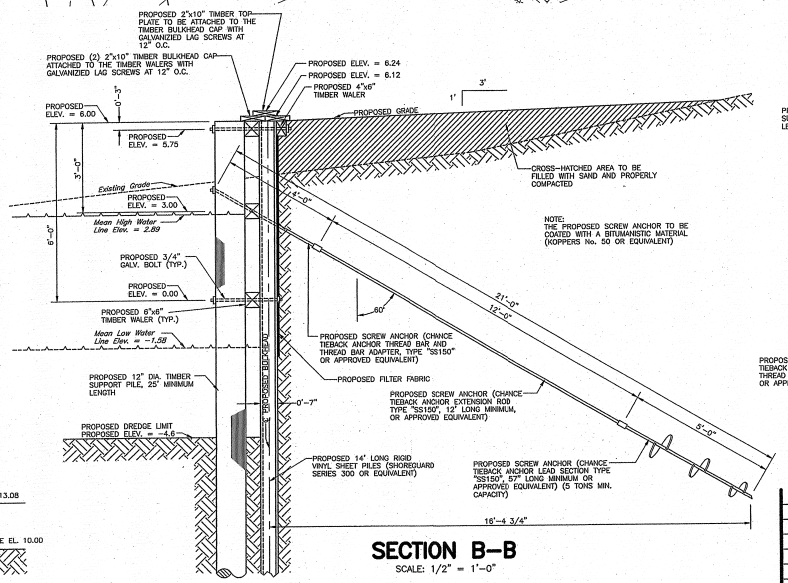
SPOILS DIKE SECTION
NOT TO SCALE



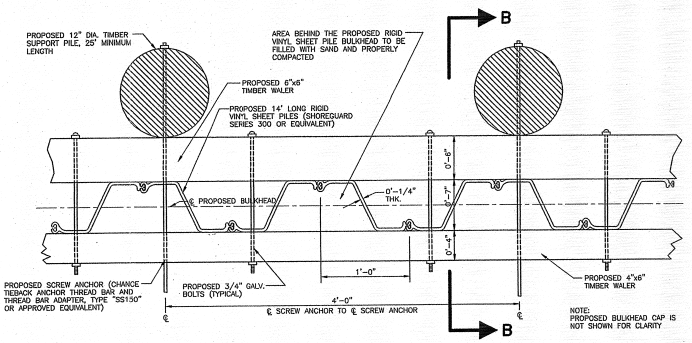


SCALE: 1" = 30'

△ ● - Proposed Sample Locations



SECTION B-B
SCALE: 1/2" = 1'-0"



RIGID VINYL SHEET PILE BULKHEAD DETAIL
SCALE: 1-1/2" = 1'-0"

ISSUED FOR PERMIT APPLICATION

DATE	REVISIONS
03/23/99	GENERAL REVISIONS PER N.J.D.E.P. LETTER DATED FEBRUARY 16, 1999

PREPARED BY:

Walter E. Surran Jr.

WALTER E. SURRAN, JR
PROFESSIONAL ENGINEER
N.J.P.E. LICENSE NO. 31859

DRAWN: WES | CHECKED: MJG

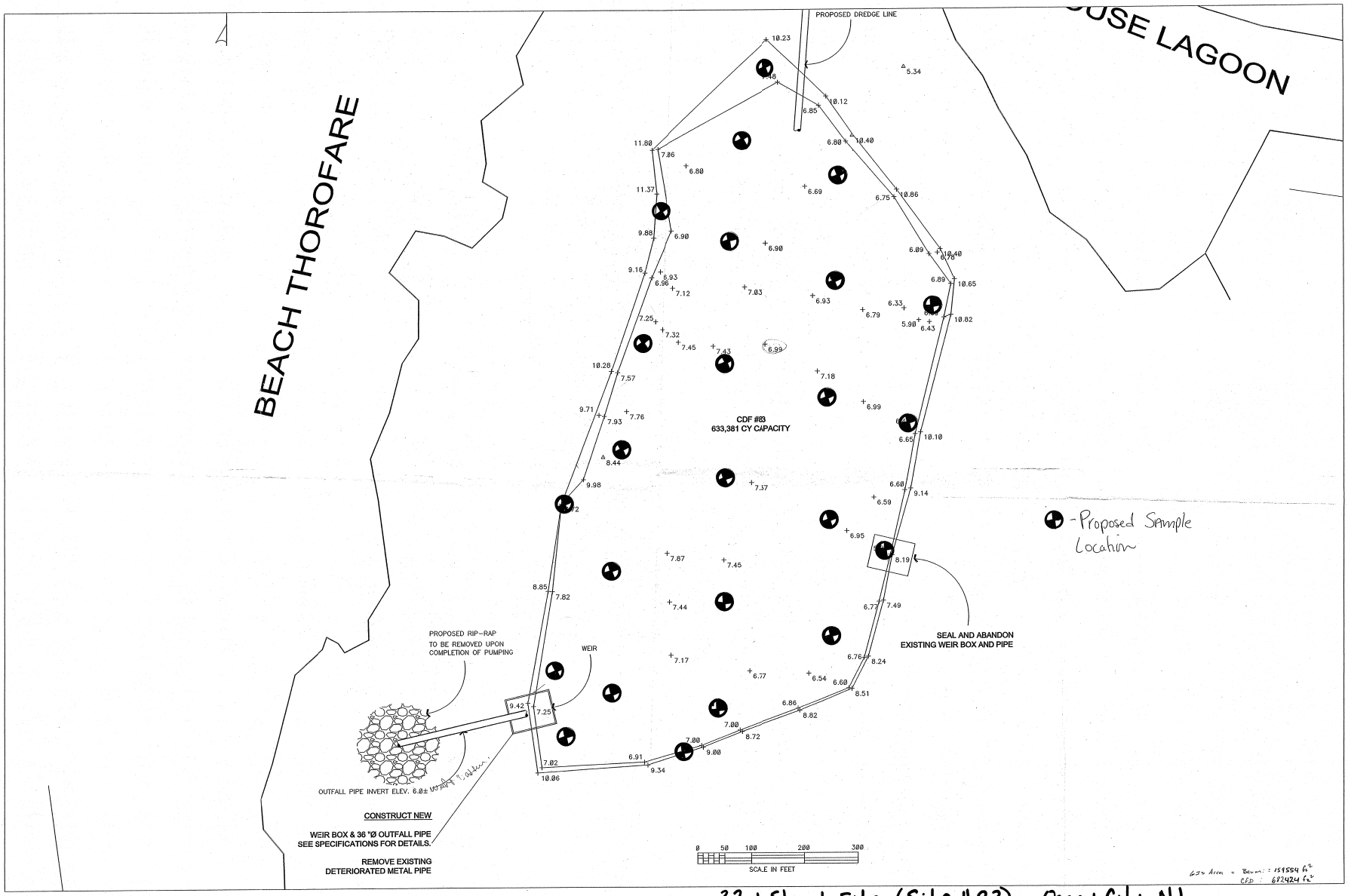
GIBSON ASSOCIATES, P.A.
CONSULTING ENGINEERS AND SURVEYORS
4211 LANDIS AVENUE
SEA ISLE CITY, NEW JERSEY 08243-1921
(609) 263-3178

UPLAND CONFINED DISPOSAL FACILITY (C.D.F.)
for
HINCH MARINA, INC.
LOT 15.07, BLOCK 793
LOWER TOWNSHIP
CAPE MAY COUNTY, NEW JERSEY

DATE: 01-07-98 | SCALE: 1"=30' | SHEET 3 OF 3 | DWG. NO.: 2382-2

SHEET3.DWG F-1429

Site 83 in Ocean City, NJ



32nd Street Site (Site #83) - Ocean City, NJ

Corps Site D in Cape May, NJ

Horizontal reference – NAD 83, New Jersey State Plane, Zone 2900, U.S. Foot.

Vertical reference – NAVD 88

Elevations are expressed in Feet and Tenths and refer to NAVD 88.

5' Contour Interval is shown thus:

1' Contour Ineterval is shown thus:

The information depicted on this map represents the results of surveys made on the dates indicated and can only be considered as indicating the general conditions existing at that time.

● - Proposed Sample Locations

Scale in Feet

100 0 100 200 300

US Army Corps of Engineers
Philadelphia District

Mark	Description	Date	Appr.	Mark	Description	Date	Appr.

U.S. ARMY ENGINEER DISTRICT, PHILADELPHIA
CORPS OF ENGINEERS
PHILADELPHIA, PENNSYLVANIA

TRACED BY	PLOTTED BY	DRAWING NO.	Designed by:		Date: / Rev.
M.Wallowicz	M.Wallowicz		Dwn by:	Ckd by:	IFB DACW61–
SURVEYED BY	DATE SURVEYED	APPROVED	Reviewed by:		Drawing code:
C.Cipriani	Apr/May 2002	CHIEF, SURVEY BRANCH	Submitted by: Chief, Arch. Branch		File name: Plot date: May/22/2002 Plot scale: 1in to 100 ft

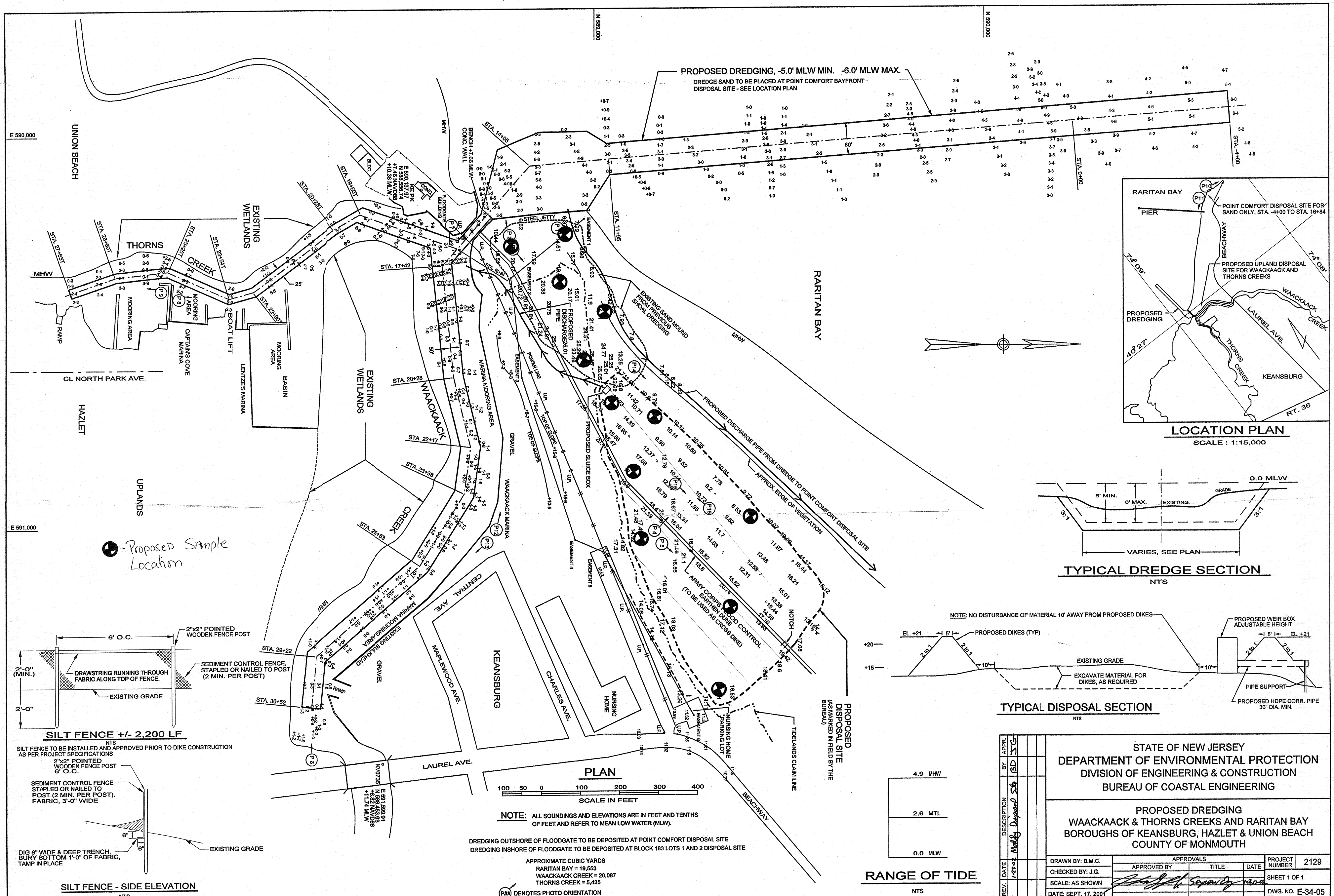
DISPOSAL AREA – VICINITY OF HIGBEE BEACH
CAPE MAY COUNTY, NEW JERSEY

TOPOGRAPHIC SURVEYS

Sheet reference number:

Sheet 1 of 1

Waackaack Creek in Keansburg, NJ


PROPOSED DREDGING, -5.0' MLW MIN. -6.0' MLW MAX.
DREDGE SAND TO BE PLACED AT POINT COMFORT BAYFRONT DISPOSAL SITE - SEE LOCATION PLAN
N 589,000
N 590,000
E 590,000
E 591,000
UNION BEACH
HAZLET
UPLANDS
KEANSBURG
RARITAN BAY
THORNS CREEK
WAACKAACK CREEK
EXISTING WETLANDS
MHW
CL NORTH PARK AVE.
MOORING AREA
CAPTAIN'S COVE MARINA
BOAT LIFT
LENTZE'S MARINA
BASIN
RAMP
FLOODGATE BUILDING
BENCH +7.66 MLW CONC. WALL
STEEL JETTY
MARINA MOORING AREA
WAACKAACK MARINA
GRAVEL
EXISTING BULKHEAD
POWER LINE
TOP OF SLOPE
PROPOSED SLUICE BOX
PROPOSED DISCHARGE PIPE
EXISTING SAND MOUND FROM PREVIOUS SHOAL DREDGING
PROPOSED DISCHARGE PIPE FROM DREDGE TO POINT COMFORT DISPOSAL SITE
APPROX. EDGE OF VEGETATION
ARMY CORPS FLOOD CONTROL EARTHEN DUNE (TO BE USED AS CROSS DIKE)
NOTCH
PROPOSED DISPOSAL SITE (AS MARKED IN FIELD BY THE BUREAU)
TIDELANDS CLAIM LINE
NURSING HOME
NURSING HOME PARKING LOT
CENTRAL AVE
MAPLEWOOD AVE.
CHARLES AVE.
LAUREL AVE.
BEACHWAY
EASEMENT 1
EASEMENT 3
EASEMENT 4
EASEMENT 5
EASEMENT 6
KV0735 E 591,599.91 N 588,453.93 +8.82 NAVD88 +11.74 MLW
KE PK E 590,137.97 N 588,556.74 +7.48 NAVD88 +10.38 MLW
STA. -4+00
STA. 0+00
STA. 11+95
STA. 14+05
STA. 17+42
STA. 19+50T
STA. 20+28T
STA. 20+28
STA. 22+17
STA. 22+90
STA. 23+38
STA. 23+54T
STA. 25+25T
STA. 25+53
STA. 26+60T
STA. 27+83T
STA. 29+22
STA. 30+52
- Proposed Sample Location
PLAN
100 50 0 100 200 300 400
SCALE IN FEET
NOTE: ALL SOUNDINGS AND ELEVATIONS ARE IN FEET AND TENTHS OF FEET AND REFER TO MEAN LOW WATER (MLW).
DREDGING OUTSHORE OF FLOODGATE TO BE DEPOSITED AT POINT COMFORT DISPOSAL SITE
DREDGING INSHORE OF FLOODGATE TO BE DEPOSITED AT BLOCK 183 LOTS 1 AND 2 DISPOSAL SITE
APPROXIMATE CUBIC YARDS
RARITAN BAY = 19,553
WAACKAACK CREEK = 20,087
THORNS CREEK = 5,435
P## DENOTES PHOTO ORIENTATION
6' O.C.
2"x2" POINTED WOODEN FENCE POST
SEDIMENT CONTROL FENCE, STAPLED OR NAILED TO POST (2 MIN. PER POST)
DRAWSTRING RUNNING THROUGH FABRIC ALONG TOP OF FENCE.
EXISTING GRADE
2'-0" (MIN.)
2'-0"
SILT FENCE +/- 2,200 LF
NTS
SILT FENCE TO BE INSTALLED AND APPROVED PRIOR TO DIKE CONSTRUCTION AS PER PROJECT SPECIFICATIONS
2"x2" POINTED WOODEN FENCE POST 6' O.C.
SEDIMENT CONTROL FENCE STAPLED OR NAILED TO POST (2 MIN. PER POST). FABRIC, 3'-0" WIDE
DIG 6" WIDE & DEEP TRENCH, BURY BOTTOM 1'-0" OF FABRIC, TAMP IN PLACE
SILT FENCE - SIDE ELEVATION
NTS
RARITAN BAY
PIER
POINT COMFORT DISPOSAL SITE FOR SAND ONLY, STA. -4+00 TO STA. 16+84
BEACHWAY
PROPOSED UPLAND DISPOSAL SITE FOR WAACKAACK AND THORNS CREEKS
PROPOSED DREDGING
WAACKAACK CREEK
LAUREL AVE.
THORNS CREEK
KEANSBURG
RT. 36
74°09'
74°08'
40°27'
LOCATION PLAN
SCALE : 1:15,000
0.0 MLW
5' MIN.
6' MAX.
EXISTING GRADE
3:1
VARIES, SEE PLAN
TYPICAL DREDGE SECTION
NTS
NOTE: NO DISTURBANCE OF MATERIAL 10' AWAY FROM PROPOSED DIKES
EL. +21
PROPOSED DIKES (TYP)
2 to 1
+20
+15
EXISTING GRADE
EXCAVATE MATERIAL FOR DIKES, AS REQUIRED
PROPOSED WEIR BOX ADJUSTABLE HEIGHT
PIPE SUPPORT
PROPOSED HDPE CORR. PIPE 36" DIA. MIN.
TYPICAL DISPOSAL SECTION
NTS
4.9 MHW
2.6 MTL
0.0 MLW
RANGE OF TIDE
NTS
REV. | DATE | DESCRIPTION | BY | APPR.
1 | 1-23-02 | Modify Disposal Site | BD | JG
STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENGINEERING & CONSTRUCTION
BUREAU OF COASTAL ENGINEERING
PROPOSED DREDGING
WAACKAACK & THORNS CREEKS AND RARITAN BAY
BOROUGHS OF KEANSBURG, HAZLET & UNION BEACH
COUNTY OF MONMOUTH
DRAWN BY: B.M.C.
CHECKED BY: J.G.
SCALE: AS SHOWN
DATE: SEPT. 17, 2001
APPROVALS
APPROVED BY
TITLE
DATE
PROJECT NUMBER 2129
SHEET 1 OF 1
DWG. NO. E-34-05

Curran, Jennifer L.

From: Suzanne Dietrick [Suzanne.Dietrick@dep.state.nj.us]
Sent: Thursday, December 22, 2005 1:20 PM
To: Dave Risilia; Curran, Jennifer L.
Cc: dolce@aquasurvey.com; GENEVIEVE.BOEHM@dot.state.nj.us; Mueller, Werner G.
Subject: Re: Proposed composits for remaining CDFs

The proposed sampling/compositing scheme looks fine.

>>> "Curran, Jennifer L." <Jennifer.Curran@hdrinc.com> 12/21/05 2:51 PM
>>>
Dave/Suzanne,
Attached is our proposed compositing schemes for the remaining 4 CDFs to be sampled under the I Boat NJ CDF Sampling Program. The document provides a description of the proposed composites and site plans that show their locations. At this point we are assuming that the cores to be composited will contain similar material. We propose to combine the material from each distinct strata of the cores. If we find that the material within the strata or the cores is different, we will not
combine the samples.

Aqua Survey is currently sampling Waackaack Creek.

Please let us know if you approve of the plan.
Thanks,
Jennifer Curran
<<Compositing Proposal.pdf>>