Pelz, Susan

From: Joseph O'Neill [joneill@jonesedmunds.com]
Sent: Tuesday, August 22, 2006 3:42 PM
To: Pelz, Susan
Cc: Joseph O'Neill; Richard Siemering; Carlos Restrepo
Subject: Section 8- Leachate Pipe Profiles

Good afternoon Susan,

Per our conversation yesterday, I checked the pipe profiles to make sure that the as-built pipe elevations were used as a starting reference elevation. They are. (refer to Sec8Pipe Profiles calcs.pdf)

From the as-built elevations, the settlement numbers computed by SCS Engineers were used to determine the post-settled elevation for Section 7&8 Buildout and Site "A" Buildout.

The as-built pipe survey has numerous individual elevations and we have an exaggerated vertical scale shown on the profile hence the "wavy" profile. We only have three settlement points (as shown on the Sec8Pipe Profiles.pdf). We connected the three points with straight lines therefore there may be places in between the post-settlement points were the settled profile has the "appearance" of being "above" the initial as-built pipe profile.

I hope this helps clarify the pipe profiles.

Thanks you, please call with any questions.

Joseph H. O'Neill, P.E.
Solid Waste Department Manager

Jones Edmunds & Associates, Inc.
324 South Hyde Park Avenue Suite 250
Tampa, Florida 33606
Phone (813) 258-0703 x132
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joneill@jonesedmunds.com
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-----Original Message-----
From: Carlos Restrepo
Sent: Tuesday, August 22, 2006 3:29 PM
To: Joseph O'Neill
Subject: Sec 8 Leachate Pipe Profiles

Carlos A Restrepo

Jones Edmunds & Associates
324 S. Hyde Park Avenue, Suite 250
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JONES EDMUNDS
ENGINEERS | ARCHITECTS | SCIENTISTS

PROJECT NUMBER: 0944902001 SHEET 1 OF 2
PROJECT NAME: SEC 8
BY: CAR DATE: 12/8/06
SUBJECT: SEC 8 LEACHATE PIPE SETTLEMENTS
CHECKED BY: TMO DATE: Aug 22 2006

Settlements

Point 1

7 & 8 Buildout = 0.22' } See Appendix 1 Sec 8 Operations Permit Application
Final Buildout = 0.67' } SCS Engineers Aug 2005

Point 1 (As built)
Elevation = 131.87' ✓ See Appendix 1 Sec 8 Construction Certification Report (As Built survey drawing) Jones Edmunds May 2006

7 & 8 Buildout = 131.87' - 0.22' = 131.65' ✓
Final Buildout = 131.87' - 0.67' = 131.2' ✓

Point 2

7 & 8 Buildout = 0.06' } Settlements
Final Buildout = 0.15' }
As Built EL = 133.13' ✓

7 & 8 Buildout = 133.13' - 0.06' = 133.07' ✓
Final Buildout = 133.13' - 0.15' = 132.98' ✓

Point 3

7 & 8 Buildout = -0.02' } Settlements
Final Buildout = 0.14' }
As Built EL = 135.12 ✓

7 & 8 Buildout = 135.12' - (-0.02') = 135.14' ✓
Final Buildout = 135.12' - 0.14 = 134.98' ✓

Point 4

7 & 8 Buildout = 0.36' } Settlements
Final Buildout = 0.54' }
As Built EL = 132.94' ✓

7 & 8 Buildout = 132.94' - 0.36' = 132.58 ✓
Final Buildout = 132.94' - 0.54' = 132.4 ✓

JONES EDMUNDS
ENGINEERS | ARCHITECTS | SCIENTISTS

PROJECT NUMBER: 08449 02001 SHEET 2 OF 2
PROJECT NAME: SEC 8
BY: CAR DATE: 22/8/06
SUBJECT: SEC 8 LEACHATE PIPE SETTLEMENTS
CHECKED BY: JHO DATE: Aug 22, 2006

POINT 5

7 & 8 Buildout = 0.09' } Settlements
Final Buildout = 0.12' }
As Built EL = 134.81 ✓

7 & 8 Buildout = 134.81' − 0.09' = 134.72' ✓
Final Buildout = 134.81' − 0.12' = 134.69' ✓

Point 6

7 & 8 Buildout = −0.02' } Settlements
Final Buildout = 0.10' }
As Built EL = 137.03' ✓

7 & 8 Buildout = 137.03' − (−0.02') = 137.05' ✓
Final Buildout = 137.03' − 0.10 = 136.93' ✓

Point 7

7 & 8 Buildout = 0.29' } Settlements
Final Buildout = 0.28' }
As Built EL = 134.50' ✓

7 & 8 Buildout = 134.50' − 0.29' = 134.21' ✓
Final Buildout = 134.50' − 0.28' = 134.22' ✓

Point 8

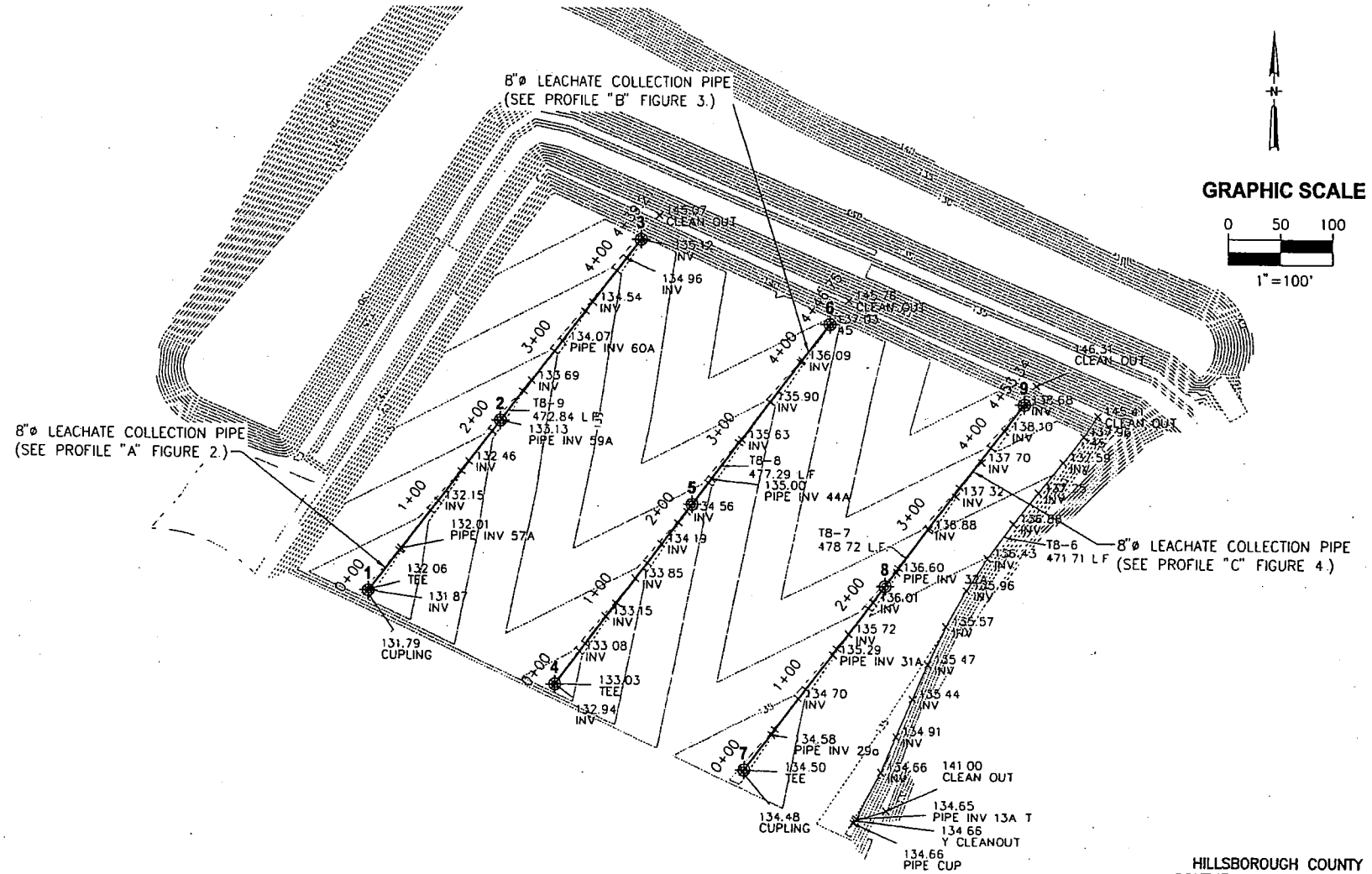
7 & 8 Buildout = 0.10' } Settlements
Final Buildout = 0.08' }
As Built EL = 136.32' ✓

7 & 8 Buildout = 136.32' − 0.10' = 136.22' ✓
Final Buildout = 136.32' − 0.08' = 136.24' ✓

Point 9

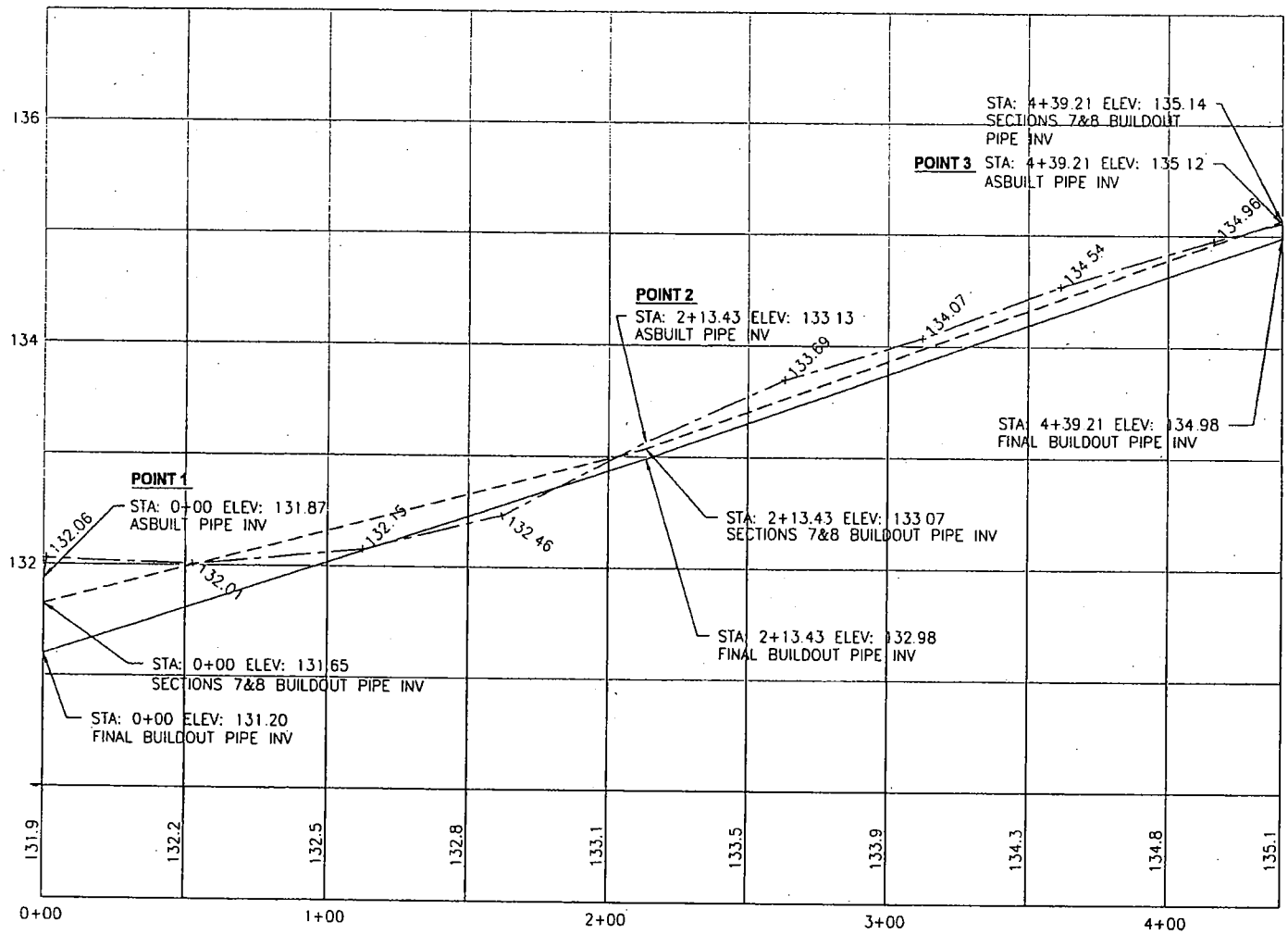
7 & 8 Buildout = −0.0052' } Settlements.
Final Buildout = 0.10' }
As Built EL = 138.68' ✓

7 & 8 Buildout = 138.68' − (−0.0052') = 138.69' ✓
Final Buildout = 138.68' − 0.10' = 138.58' ✓



HILLSBOROUGH COUNTY
SOUTHEAST COUNTY LANDFILL
SECTION 8 SITE A
LEACHATE PIPE SETTLEMENT CALCULATION
FIGURE 1. SITE PLAN

JONES EDMUNDS

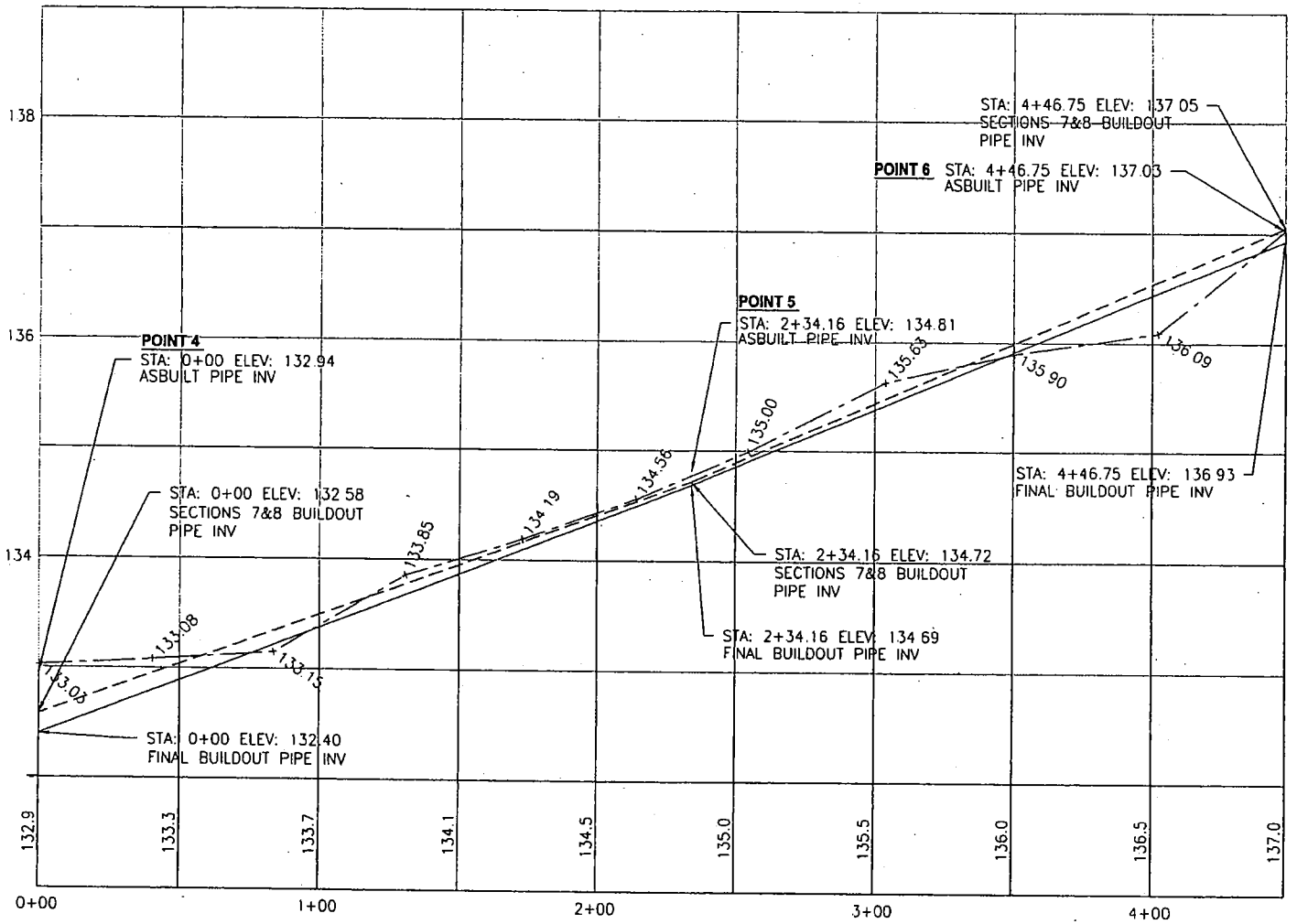


PROFILE "A"

SCALE 1"= 40' HORZ
1"= 1' VERT

HILLSBOROUGH COUNTY
SOUTHEAST COUNTY LANDFILL
SECTION 8 SITE A
LEACHATE PIPE SETTLEMENT CALCULATION
FIGURE 2. PROFILE "A"

JONES EDMUNDS

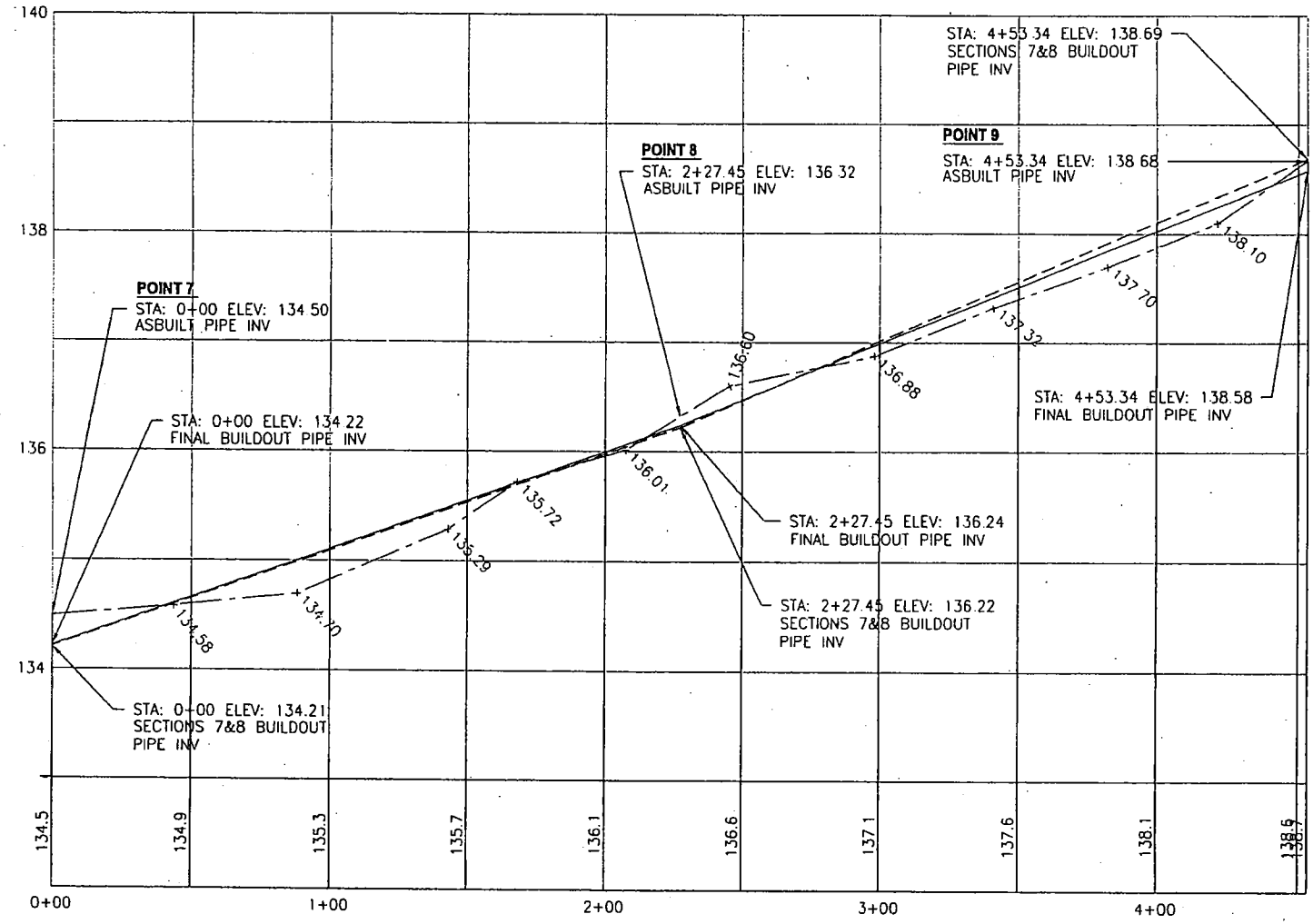


PROFILE "B"

SCALE 1"= 40' HORZ
1"= 1' VERT

HILLSBOROUGH COUNTY
SOUTHEAST COUNTY LANDFILL
SECTION 8 SITE A
LEACHATE PIPE SETTLEMENT CALCULATION
FIGURE 3. PROFILE "B"

JONES EDMUNDS



PROFILE "C"

SCALE 1"= 40' HORZ
1"= 1' VERT

HILLSBOROUGH COUNTY
SOUTHEAST COUNTY LANDFILL
SECTION B SITE A
LEACHATE PIPE SETTLEMENT CALCULATION
FIGURE 4. PROFILE "C"

JONES EDMUNDS

JONES EDMUNDS

July 24, 2006

Ms. Susan Pelz, P.E.
Florida Department of Environmental Protection
Southwest District
13051 North Telecom Parkway
Temple Terrace, Florida 33637-0926

Subject: Response to Request for Additional Information
Southeast County Landfill, Hillsborough County
Capacity Expansion Section 8
Certification of Construction Completion
Permit No. 35453-009-SC
Jones Edmunds Project No. 08449-020-01

Dear Ms. Pelz:

Following our meeting on June 14, 2006 to discuss the Section 8 Certification of Construction Completion Report (Report), you had requested some additional information to be submitted to our office to assist you with completion your approval of the Report. The additional information that you requested is listed below.

Comment 1) Please clarify the photograph dated November 3, 2005. (Refer to the Department's Comment Number 3.C.4).

Response 1: As discussed during the meeting, no damage was observed to the primary geomembrane as shown in the submitted photographs; however, the location of the damaged geocomposite was mistakenly placed on the secondary as-built panel layout. Provided in Attachment 1 is a revised Primary As-Built panel layout that shows the damage location (approximately over Primary Panel 48).

Also included in Attachment 1 is a revised Secondary as-built panel layout that was included to provide clarification or answer others comments.

Comment 2) Please provide a revised Geomembrane Panel Layout that shows the "tear" mentioned in the field notes on the primary geomembrane panel layout. The "tear" was mistakenly placed on the secondary panel layout (Refer to the Department Comment Number 3.c.4) .

Response 2: A revised Geomembrane Panel Layout is provided in Attachment 1 with the corrected location of the geocomposite "tear".

324 South Hyde Park Avenue
Suite 250
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813.258.0703 Phone
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FILE

Comment 3) Please provide photograph of the "blow out", if any available, for the berm dated November 9, 2005).

Response 3: Additional photographs are provided in Attachment 2. As shown, no damage occurred to the primary geomembrane.

Comment 4) Please verify that the area referred to in the Department Comment Number 3.c.7 was in the ERC layout area.

Response 4: The area referred to in the November 19, 2005 QES Daily Field Report was in the ERC layout area (outside of the Section 8 lined area). Provided in Attachment 3 is a photograph of the area in question.

Comment 5) The "cap" repair is shown on the northend of the Panel 27/28 does not have a repair number. Please clarify if the repair is actually on Panel 27/28. If present, please provide a repair number, repair logs, or a revised Geomembrane Panel Layout.

Response 5: We have reviewed the repair logs, non-destructive logs, and coordinated with the QES Field QA technician and it appears that Repair No. 44 was mistakenly placed in the wrong location on the as-built panel layout drawings. Repair No. 44 (identified as "CAP") should have been placed on the north end of seam 27/28. A revised secondary panel layout drawing is provided in Attachment 1.

Comment 6) Please provide a summary of the welding, repairs, and testing for the cap strip on the southend of Panel 27/28.

Response 6: Please refer to Response No. 5 (Repair No. 44 "Cap" shown in the incorrect location). Initial seaming of Seam 27/28 was conducted on September 26, 2005. A destructive seam sample, DT-8, was removed from the seam and failed field testing on September 27, 2005. Technician "DN", using machine number 37, completed the seam. Destructive Seam test DT-8A was pulled, tested, and passed specifications. This was the northern boundary of the seam failure. Seams immediately adjacent to Seam 27/28 were completed by another technician. The southern end of the seam that was prepared by Technician "DN", using machine number 37, was seamed 26/32. A passing destructive seam sample, DT-8A, was taken from that seam and it passed specifications. Therefore, destructive seam samples DT-8A and DT-8B represent the limits of the fusion weld that failed to meet specifications. A subsequent repair cap strip was placed over the entire portion of the seam that failed. A representative destructive seam sample was taken of the repair (Destructive test DT-26) to verify that the extrusion weld meet specifications.

The following table was prepared to clarify the repairs, non-destructive and destruction seam testing for seam number 27/28.

Repair Number	Destructive Test Number	Comment
R45		Initial seam failure; placed under repair cap (Repair No. 102; See Gemembrane Repair Log page 5).
R48		Seam repair placed under repair cap ((Repair No. 102; See Gemembrane Repair Log page 5).
R49		Seam repair placed under repair cap ((Repair No. 102; See Gemembrane Repair Log page 5).
R96		Seam repair placed under repair cap ((Repair No. 102; See Gemembrane Repair Log page 5).
R97		Seam repair placed under repair cap ((Repair No. 102; See Gemembrane Repair Log page 5).
R98		Seam repair placed under repair cap ((Rep.air No. 102; See Gemembrane Repair Log page 5).
R102		Repair cap over failed portion of seam 27/28.
	DT-8	Initial destructive seam sample failure (See Destructive Log page 1)
	DT-8A	Passed destructive seam test result from same welder/machine (See Seaming log page 3; Destructive Log page 1).
	DT-8B	Passed destructive seam test result from same welder/machine (See Seaming log page 3; Destructive Log page 1).
	DT-26	Representative test result of extrusion weld for repair cap over the entire portion of the seam 27/28 that failed. (See Destructive Log page 2).

Comment 7) Please provide a statement from the QES field inspector, or others, the damage noted on Secondary Geomembrane Panel 43 was the result of handling by a forklift (Refer to the Department's Comment Number 3.d.2) .

Response 7: **The size and shape of the damage to the panel was consistent with the dimensions of the fork on the forklift. Provided in Attachment 4 is a statement from QES regarding what they observed and concluded. As previously noted, the damage was repaired, tested, and passed QA testing.**

Comment 8) Please provide a Section 8 pipe profile for each leachate collection line with settlement estimates (Refer to the Department's Comment Number 4.a) .

Response 8: **Provided in Attachment 5 is a profile of each pipe based upon information supplied by Pickett and Associates during construction. In addition, settlement**

estimates were preformed by SCS Engineer's for the filling of Sections 7, 8, and 9 and Final Buildout of Site "A". The as-built and projected pipe profiles are contained in Attachment 5. Conclusion, the pipes will have positive slope drainage towards Section 7.

Comment 9) Please verify that the excavator shown in the photograph dated 11/01/05 is "low ground pressure" (Refer to the Department's Comment Number 9.a).

Response 9: The ground pressure of the Kobelco Model 235SR LC excavator shown in the photograph dated 11/01/05 has a ground pressure of approximately 5.6 pounds per square inch (psi). For comparison, the John Deere 700H LGP (Low Ground Pressure) dozer that was used to spread the drainage sand across Section 8 has a slightly higher ground contact pressure of 5.5 psi. Therefore, the excavator shown in the photograph dated 11/01/05 is similar to a "low ground pressure" dozer. Please refer to the documentation of the Kobelco 235SR LC and John Deere 700H LGP vehicles provided in Attachment 6

Comment 10) Please provide a photograph of the geomembrane installation referred to in the Department's comment number 11.

Response 10: Provided in attachment 7 are additional photographs of the secondary geomembrane installation.

Comment 11) Please provide explaination or resubmittal of QES QA log dated 10/6/06 with repair number 52/54 (Refer to the Department's Comment Number 11b.1) .

Response 11: Provided in Attachment 8 is a revised QES QA log (Sheet 5, Secondary Geomembrane Repair Log) that has a revised patch size for Repair No. 106 (2'x4') that matches the cap dimensions shown on Sheet 5, Secondary Geomembrane Seaming Log.

Comment 12) Please resubmit QES QA Repair Log showing Panel 27-tie-in as an extrusion weld (Refer to the Department's Comment Number 11.b.2).

Response 12: Provided in Attachment 9 is a revised QES QA log (Sheet 6, Secondary Non-Destructive Log) that indicates that Seam 27-tie-in was extrusion welded.

Comment 13) Please resubmit QES Repair Log with repair shown as a 2 ft x 6 ft patch (Refer to the Department's Comment Number 12.b.1).

Response 13: Provided in Attachment 10 is a revised QES QA log (Sheet 2, Primary Geomembrane Repair Log) has been revised to show repair No. 35 a 2 foot x 6 foot patch.

Comment 14) Please resubmit QES Repair log with repair numbers referred to in the Department's comment number 12.b.2, specifically seam 43A-42, 21-7,21-12,and 24-25.

Response 14: **Seam 43A-42 was fusion welded and the t-weld where the air pressure test was conducted was repaired and vacuum box tested (See Repair No. 56, sheet 3).**

Seam 7-8-21 was fusion welded and failed to hold air pressure. Repair Number 22 was the repair of that entire seam. The length of the repair was incorrectly typed into the geomembrane log. The length of Repair Number 22 has been revised to show the entire length was repaired with a cap strip and vacuum box tested. In addition, the Primary as-built panel layout has been modified to show the cap strip.

Seam 12-13-21 was fusion welded and failed to hold air pressure. Repair Number 17 was the repair of that entire seam. The length of the repair was incorrectly typed into the geomembrane log. The length of Repair Number 17 has been revised to show the entire length was repaired with a cap strip and vacuum box tested. In addition, the Primary as-built panel layout has been modified to show the cap strip.

Seam 25-21-TIE-IN was fusion welded and failed to hold air pressure. The seaming log (Sheet 2) indicates that the length of the seam was approximately 7 feet in length. The length of Repair Number 6 was incorrect. The corrected length of the cap strip is 5 feet. The combined length of Repair Numbers R6 (5 feet) and R7 (2 feet) is 7 feet (the entire seam length). The length of Repair Number 6 has been revised to show the entire length was repaired with a cap strip and vacuum box tested. In addition, the Primary as-built panel layout has been modified to show the cap strip.

Seam 23-24-25 was fusion welded and failed to hold air pressure. The seaming log (Sheet 1) indicates that the length of the seam was approximately 6 feet in length. The length of Repair Number 5 was incorrect. The corrected length of the cap strip is 6 feet (the entire seam length). The length of Repair Number 5 has been revised to show the entire length was repaired with a cap and vacuum boxed. In addition, the Primary as-built panel layout has been modified to show the cap strip.

Provided in Attachment 11 is the revised QES QA log.

Comment 15) Please provide signed and sealed QA reports from QORE for the drainage sand.

Response 15: **Provided in Attachment 12 are signed and sealed copies of the QORE report for the drainage sand.**

Comment 16) Please clarify is Page 1of 1 referred to in the Department comment 19.b.2 is cut-off or please resubmit a complete sheet(Refer to the Department's Comment Number 19.b.2).

Response 16: **Per our discussion, the top of the page for MQC documentation for the geocomposite material, specifically Batch 2, Section 2, was cut-off during copying of the documentation by the manufacturer.**

Comment 17) Please confirm that thickness measurements were made on the geocomposite and not the geonet (Refer to the Department's Comment Number 19.c) .

Response 17: **The thickness measurements were conducted on the final geocomposite. This was done to allow for the estimation of the final products hydraulic conductivity from the QA laboratories transmissivity values.**

Comment 18) Please confirm that the "gray" material shown in Photograph dated 9/20/05 is bentonite (Refer to the Department's Comment Number 21.a.7).

Response 18: **Jones Edmunds has reviewed the photograph and the "gray" material appears to be bentonite powder that was spread over some surface cracks that developed in the subbase prior to installation of the secondary geomembrane.**

Comment 19) Please resubmit Drawing No. 9, Detail 6 with drainage information from the Pickett Survey .

Response 19: **Provided in Attachment 13 is a revised Drawing No. 9.**

Jones Edmunds believes that the enclosed responses to the comments/questions presented in this request for additional information are complete and responsive. Please call us if you have any questions or require additional information.

Sincerely,

Richard A. Siemering
Project Manager

Joseph H. O'Neill, P.E.
Solid Waste Department Manager

cc: Patricia V. Berry, SWMD
Larry Ruiz, SWMD
Ron Cope, HCEPC
Kenneth S. Vogel,P.E., Jones Edmunds

Enclosures

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ATTACHMENT 1
Revised Primary and Secondary As-Built Panel Layouts

FILENAME	S.E. HILLSBOROUGH RECORD
DRAWING #	RD-2

MATERIAL & DRAWING DESCRIPTION:
60 MIL TEXTURED HDPE - PRIMARY
RECORD DRAWING

PROJECT NAME & LOCATION:
S.E. HILLSBOROUGH LF
TAMPA, FL

GEOSYNTHETICS, INC
GEOSYNTHETICS, INC.
W232S8988 PEWAUKEE ROAD
WAUKESHA, WI 53188
262-524-7979

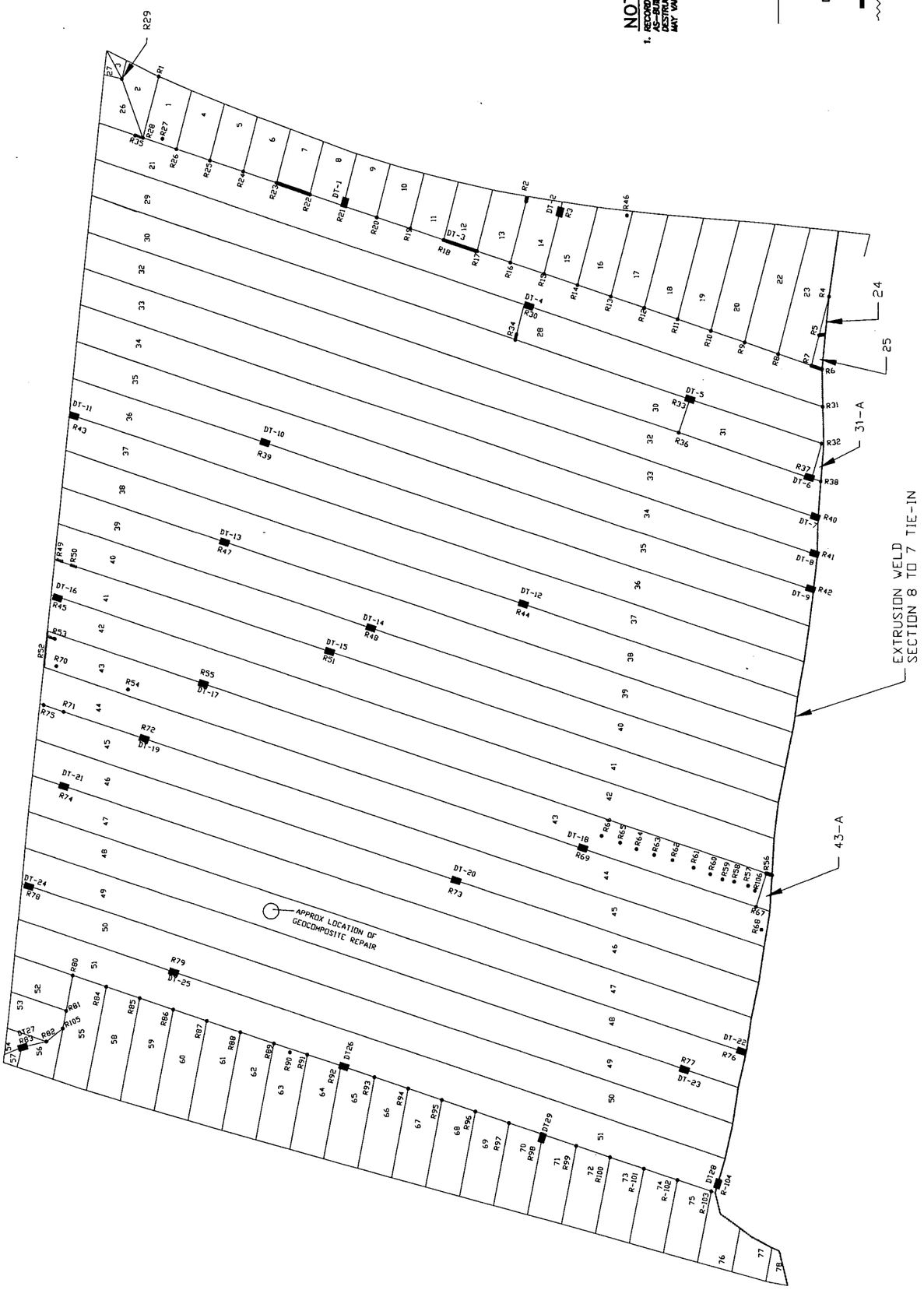
REVISIONS NO.	DATE

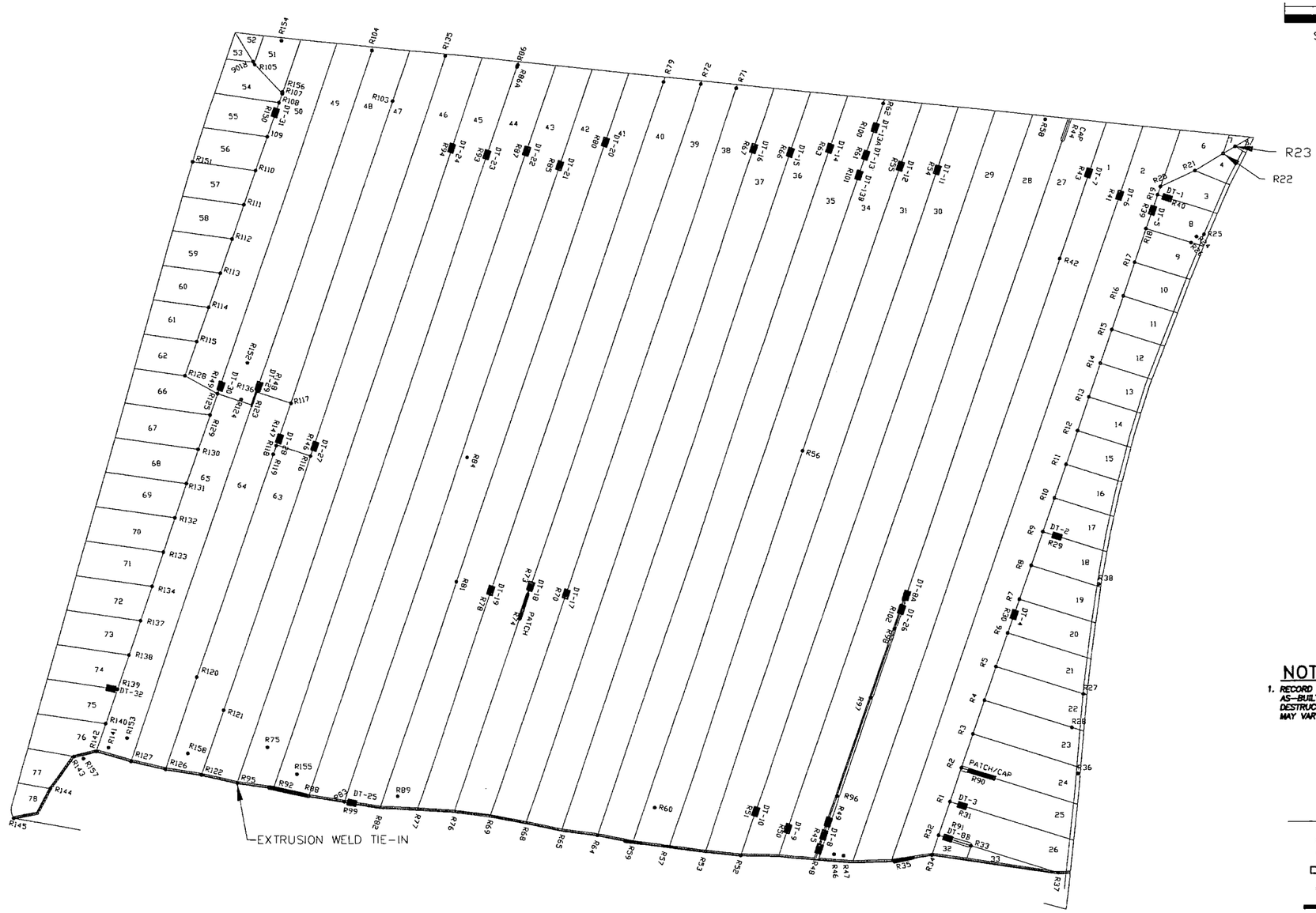
DRAWN BY: ESW DATE: 10-20/05
CHKD BY: DATE:
SCALE: 1" = 50'-0"
JOB #: 24068 EST #:L0402A5

GRAPHIC SCALE
0 25 50 100
SCALE: 1" = 50'-0"

NOTE:
1. RECORD DRAWING IS NOT A SURVEYED AS-BUILT. LOCATIONS OF REPAIRS, DESTRUCTIVE TESTS, AND EXTRUSION WELDS MAY VARY SLIGHTLY.

LEGEND
- PANEL OUTLINE
- PANEL NUMBER
- PATCH
- DESTRUCTIVE TEST
- PIPE BOOT
- CAP PATCH
- EXTRUSION WELD





N

GRAPHIC SCALE

0 25 50 100

SCALE: 1" = 50'-0"

NOTE:

1. RECORD DRAWING IS NOT A SURVEYED AS-BUILT. LOCATIONS OF REPAIRS, DESTRUCTIVE TESTS, AND EXTRUSION WELDS MAY VARY SLIGHTLY.

LEGEND

- PANEL OUTLINE
- # PANEL NUMBER
- ● PATCH
- □DT# DESTRUCTIVE TEST
- ⊗ PIPE BOOT
- CAP PATCH
- EXTRUSION WELD

DRAWN BY: ESW | DATE: 10-20-05
CHKD BY: | DATE:
SCALE: 1" = 50'-0"
JOB #: 24068 | EST #:1040245

REVISIONS

NO.	DATE

GEO-SYNTHETICS, INC.
W239 N428 PEWAUKEE ROAD
WAUKESHA, WI 53188
262-524-7979

GEO-SYNTHETICS, INC

PROJECT NAME & LOCATION:
S.E. HILLSBOROUGH LF
TAMPA, FL

MATERIAL & DRAWING DESCRIPTION:
60 MIL TEXTURED HDPE - SECONDARY
RECORD DRAWING

FILENAME
S.E. HILLSBOROUGH
RECORD

DRAWING #
RD-1

ATTACHMENT 2
Additional Photographs of the berm "blow-out"

Attachment 2 – Photograph of "Blow-out" of separation berm. No damage to geomembrane

Attachment 2 – Close-up of "Blow-out" along separation berm extrusion weld

Attachment 2 – Repair of "Blow-out"

Attachment 2 – Vacuum box of repairs

ATTACHMENT 3
Photograph of the lined area in ERC layout yard

Attachment 3 – "Lined" Area in ERC layout area

ATTACHMENT 4
Statement from QES concerning forklift damage

Quality Environmental Services
"Quality is our First Name"

July 5, 2006

Mr. Joseph H. O'Neill, P.E.
Solid Waste Department Manager
324 S. Hyde Park Ave., Ste. 250
Tampa, FL 33606

Subject: Clarification on Damages Reported to Primary Geomembrane Panel 43
Southeast County Landfill, Hillsborough County
Capacity Expansion Section 8 Landfill

Dear Mr. O'Neill,

Per your request, I have reviewed our files regarding our Primary Geomembrane Repair Log, dated October 12, 2005, regarding the damage observed in the field to Primary Geomembrane Panel 43. The damage was observed upon deployment of the panel in the field. QES personnel did not witness the actual cause of the damage but from our experience, the uniform pattern, size, and shape of the damage, we concluded that the pattern of damage was consistent with that caused "generally" by a forklift.

As shown in the October 12, 2005 Primary Geomembrane Repair Logs, repairs 57 through 63, were repaired and tested in accordance with the specifications.

If you need any other clarifications, please contact us immediately.

Sincerely,

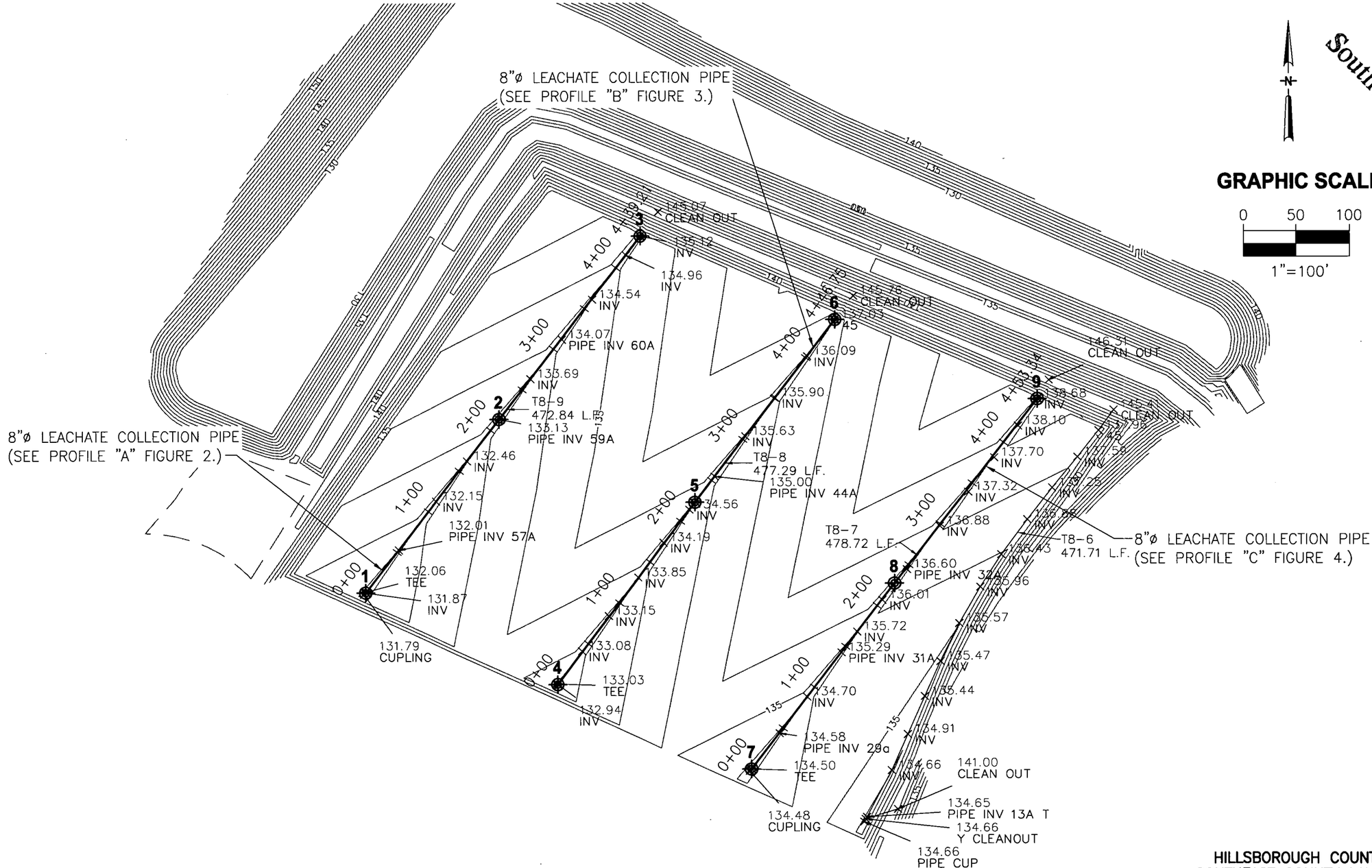
David Whalen

David Whalen
QES

Enclosures

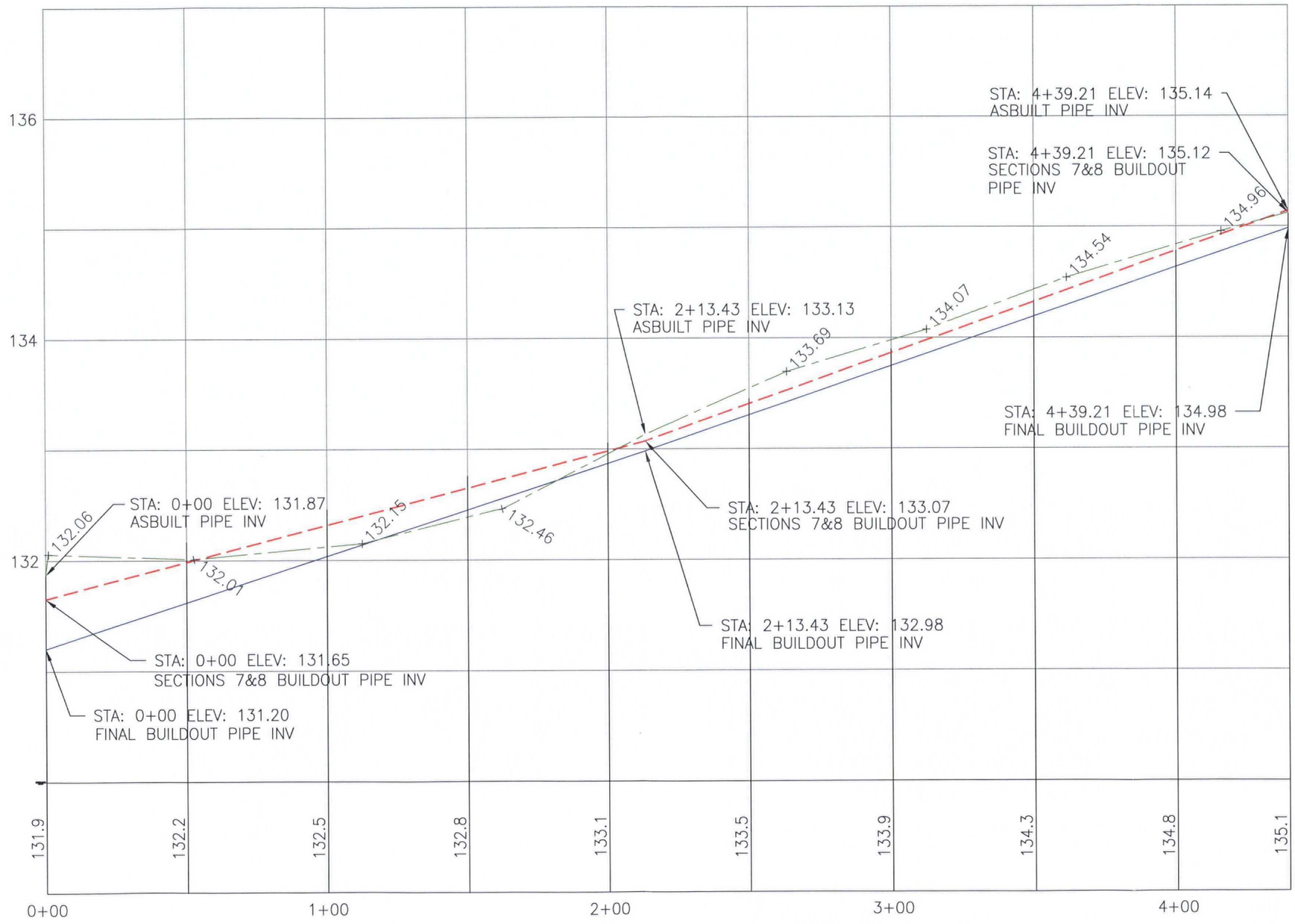
3813 Southview Drive, Suite A • Brandon, FL 33511
Phone: 813-625-2106 • Fax: 813-621-9899 Email • qescorp@juno.com

ATTACHMENT 5
Pipe Profiles



HILLSBOROUGH COUNTY
SOUTHEAST COUNTY LANDFILL
SECTION 8 SITE A
LEACHATE PIPE SETTLEMENT CALCULATION
FIGURE 1. SITE PLAN

JONES EDMUNDS

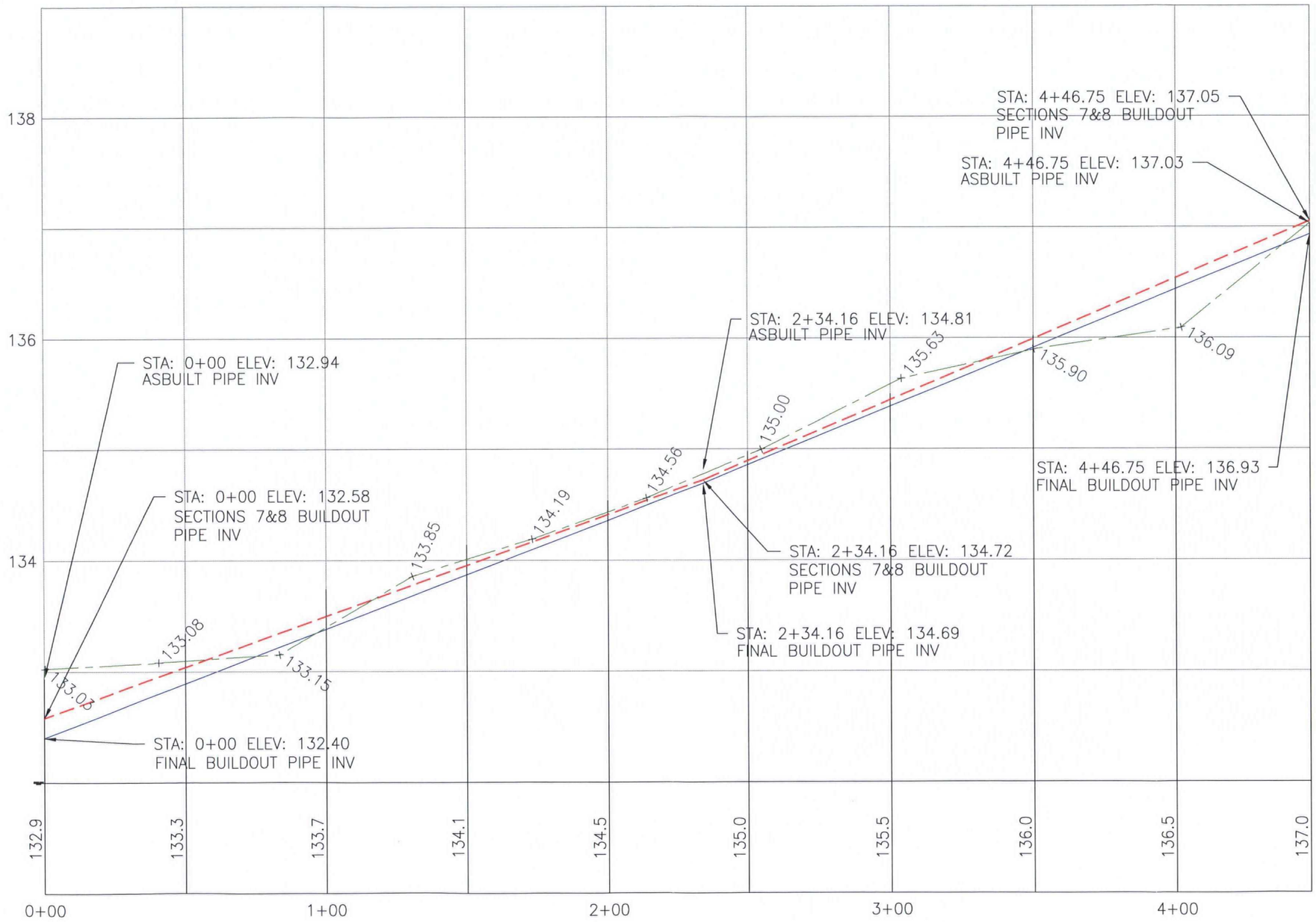


PROFILE "A"

SCALE 1"= 40' HORZ
1"= 1' VERT

HILLSBOROUGH COUNTY
SOUTHEAST COUNTY LANDFILL
SECTION 8 SITE A
LEACHATE PIPE SETTLEMENT CALCULATION
FIGURE 2. PROFILE "A"

JONES EDMUNDS

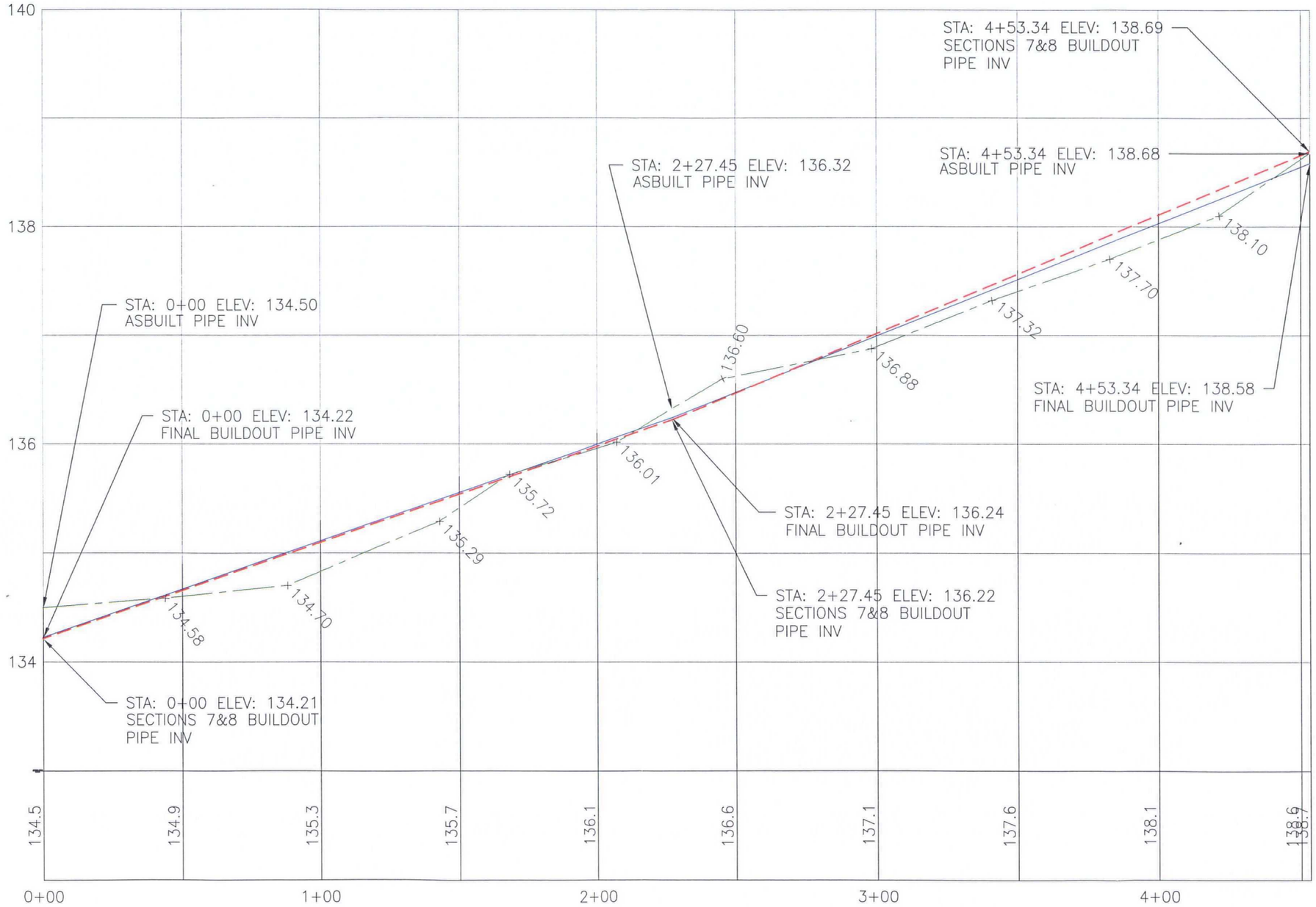


PROFILE "B"

SCALE 1"= 40' HORZ
1"= 1' VERT

HILLSBOROUGH COUNTY
SOUTHEAST COUNTY LANDFILL
SECTION 8 SITE A
LEACHATE PIPE SETTLEMENT CALCULATION
FIGURE 3. PROFILE "B"

JONES EDMUNDS



PROFILE "C"

SCALE 1"= 40' HORZ
1"= 1' VERT

HILLSBOROUGH COUNTY
SOUTHEAST COUNTY LANDFILL
SECTION 8 SITE A
LEACHATE PIPE SETTLEMENT CALCULATION
FIGURE 4. PROFILE "C"

JONES EDMUNDS

ATTACHMENT 6
Low Ground Pressure Equipment


412
11/07/2005

700H

Engine

700H LT / 700H XLT / 700H LGP

Type	John Deere PowerTech® 6068T with turbocharger
Rated power	115 SAE net hp (86 kW) / 123 SAE gross hp (92 kW) @ 2,100 rpm
Cylinders, wet sleeve	6
Displacement	414 cu. in. (6.8 L)
Fuel consumption, typical	2.4 to 4.8 gal./hr. (9.1 to 18.2 L/h)
Maximum net torque	410 lb.-ft. (525 Nm) @ 1,300 rpm
Lubrication	pressure system with full-flow spin-on filter and oil-to-water cooler
Air cleaner	dual stage dry type with safety element, precleaner, and dash-mounted restriction indicator
Electrical system	24 volt with 55-amp alternator
Cooling fan	blower-type

Transmission

Dual-path, electronic-controlled, hydrostatic drive; load-sensing feature automatically adjusts ground speed and power to match changing load conditions; each track is powered by a variable-displacement piston pump and motor combination; decelerator controls speed from 5.5 mph (8.9 km/h) to stop

Travel speeds (infinitely variable)

Forward and reverse	0 to 5.5 mph (0 to 8.9 km/h)
Reverse speed ratio control	80, 100, 115, and 130% of forward speed to maximum of 5.5 mph (8.9 km/h)

Final Drives

Heavy-duty triple-reduction final drives attach directly to the mainframe, isolated from the track frame and dozer frame loads

Steering

Single-lever steering, speed, and direction control, and counterrotation; full power turns and infinitely variable track speeds provide unlimited maneuverability and optimum control; hydrostatic steering eliminates steering clutches and brakes

Brakes

Hydrostatic (dynamic) braking stops the machine whenever the direction-control lever is moved to neutral, whenever the decelerator is depressed to the end of travel, or whenever the brake pedal is depressed

Automatic Park Brake

Exclusive safety feature engages wet, multiple-disc brakes whenever the engine stops, whenever the operator applies the brake pedal, or whenever the park lock lever is placed in the start position; machine cannot be driven with brake applied, reducing wear out or need for adjustment

Hydraulic System

System	open center
Pressure, main relief	3,200 psi (22 064 kPa)
Pump	gear-type, fixed-displacement pump
Flow	25 gpm (95 L/min.) @ 2,100 rpm
Filter, return oil	10 micron
Control	T-bar three function
Cylinders	heat-treated, chrome-plated, polished cylinder rods with hardened steel (replaceable bushings) pivot pins

Capacities (U.S.)

Fuel tank with lockable cap	60 gal. (227 L)
Cooling system with coolant recovery tank	5.6 gal. (21 L)
Engine oil including spin-on filter	20 qt. (19 L)
Transmission reservoir refill including spin-on filter	17.2 gal. (65 L)
Final drive (each)	14 qt. (13 L)
Hydraulic reservoir refill including spin-on filter	13.5 gal. (51 L)
4000S John Deere Winch, if equipped	10 gal. (38 L)

All powertrain and hydraulic systems allow maximum 45-degree off-level operation.

Undercarriage

	700H LT	700H XLT	700H LGP
John Deere Dura-Trax™ features large deep-heat-treated components; pins and bushings are sealed for life; rollers and idlers are permanently sealed and lubricated; full-length track frame covers reduce material buildup and ease cleaning			
Sprocket	segmented	segmented	segmented
Chain	sealed and lubricated	sealed and lubricated	sealed and lubricated
Track shoes, each side	40	42	42
20-in. (510 mm) grouser width (closed center, single bar)			
Ground contact area	3,818 sq. in. (24 633 cm²)	4,111 sq. in. (26 520 cm²)	4,111 sq. in. (26 520 cm²)
Ground pressure	6.8 psi (47 kPa)	6.5 psi (45 kPa)	6.5 psi (45 kPa)
22-in. (560 mm) grouser width (closed center, single bar)			
Ground contact area	4,192 sq. in. (27 048 cm²)	4,514 sq. in. (29 120 cm²)	4,514 sq. in. (29 120 cm²)
Ground pressure	6.2 psi (44 kPa)	5.9 psi (42 kPa)	5.9 psi (42 kPa)
24-in. (610 mm) grouser width (closed center, single bar)			
Ground contact area			4,917 sq. in. (31 720 cm²)
Ground pressure			5.5 psi (39 kPa)
Length of track on ground	95 in. (2415 mm)	102 in. (2600 mm)	102 in. (2600 mm)
Track gauge, standard	70 in. (1778 mm)	70 in. (1778 mm)	78 in. (1981 mm)
Oscillation (at front idler)	7 in. (178 mm)	7.7 in. (196 mm)	7.7 in. (196 mm)
Track rollers, each side	6	7	7
Carrier rollers, each side	1		1
Track pitch	6.91 in. (175.5 mm)	6.91 in. (175.5 mm)	6.91 in. (175.5 mm)

Optional or Special Equipment

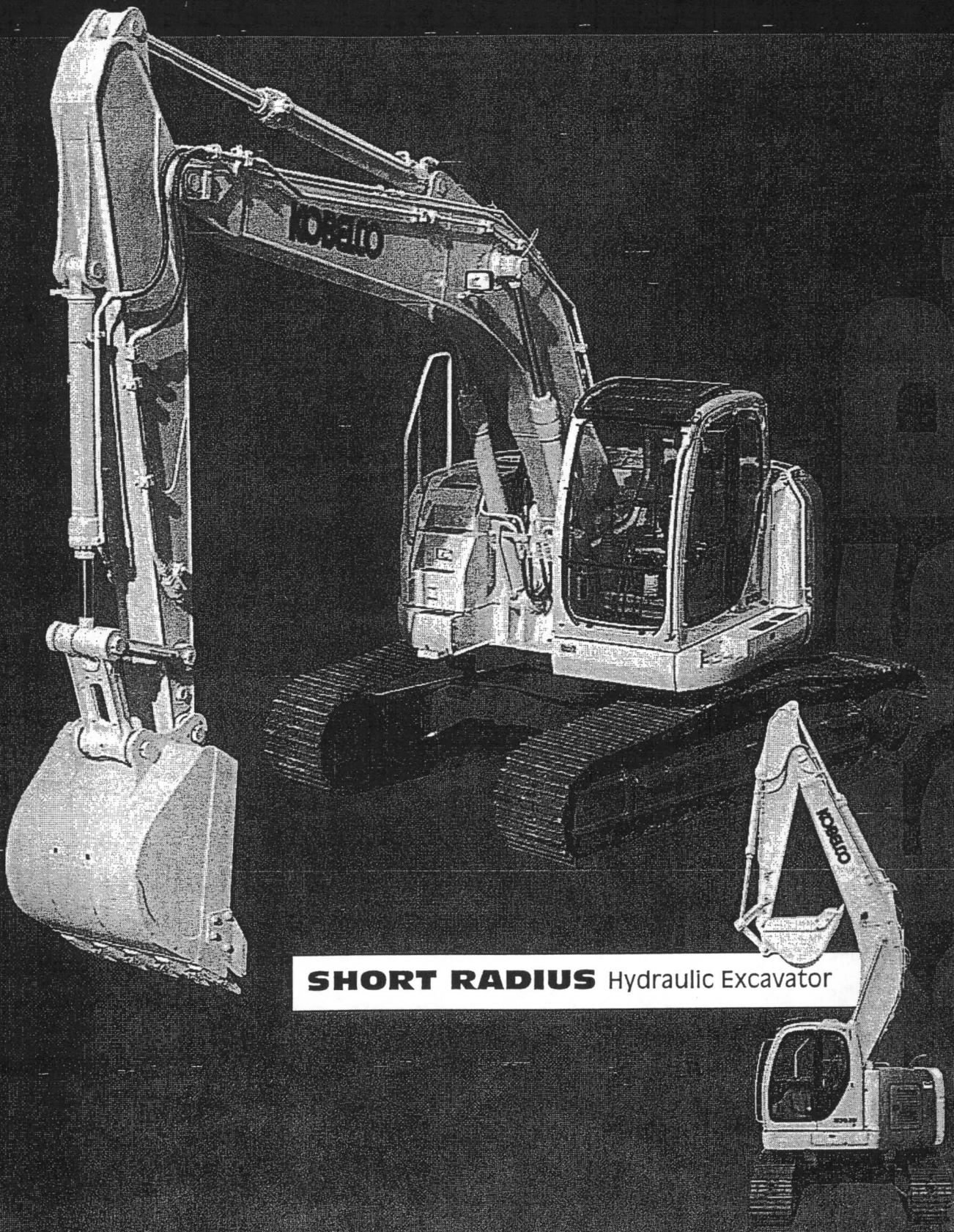
Add (+) or deduct (–) lb. (kg) as indicated to base weight for units with			
20-in. (510 mm) track shoes	included in base	– 233 lb. (– 106 kg)	– 1,375 lb. (– 624 kg)
22-in. (560 mm) track shoes	222 lb. (101 kg)	included in base	– 1,100 lb. (– 499 kg)
24-in. (610 mm) track shoes	N/A	N/A	– 681 lb. (– 309 kg)
30-in. (760 mm) track shoes	N/A	N/A	included in base
30-in. (760 mm) swamp shoes	N/A	N/A	– 31 lb. (– 14 kg)
132-in. (3353 mm) blade for LT	140 lb. (63 kg)	140 lb. (63 kg)	included in base
All-hydraulic heavy-duty C frame (less blade)	– 1,730 lb. (– 784 kg)	– 1,730 lb. (– 784 kg)	– 1,870 lb. (– 848 kg)
Cab with heater	600 lb. (272 kg)	600 lb. (272 kg)	600 lb. (272 kg)
Cab with air conditioning	635 lb. (288 kg)	635 lb. (288 kg)	635 lb. (288 kg)
Canopy heater	26 lb. (12 kg)	26 lb. (12 kg)	26 lb. (12 kg)
Counterweight, front	380 lb. (172 kg)	380 lb. (172 kg)	380 lb. (172 kg)
Deluxe seat group	20 lb. (9 kg)	20 lb. (9 kg)	20 lb. (9 kg)
Front tow hook	17 lb. (8 kg)	17 lb. (8 kg)	17 lb. (8 kg)
Fuel-fired coolant heater	12 lb. (5 kg)	12 lb. (5 kg)	12 lb. (5 kg)
Grille, extreme service with heavy-duty hose guard	112 lb. (51 kg)	112 lb. (51 kg)	112 lb. (51 kg)
Limb risers, arched	341 lb. (155 kg)	341 lb. (155 kg)	341 lb. (155 kg)
Rear screen, canopy	45 lb. (20 kg)	45 lb. (20 kg)	45 lb. (20 kg)
Rear screen, cab	91 lb. (41 kg)	91 lb. (41 kg)	91 lb. (41 kg)
Side screens (cab or canopy)	108 lb. (49 kg)	108 lb. (49 kg)	108 lb. (49 kg)
Screens, front and doors (canopy)	120 lb. (54 kg)	120 lb. (54 kg)	120 lb. (54 kg)
Screens, front and doors (cab)	151 lb. (68 kg)	151 lb. (68 kg)	151 lb. (68 kg)
Extreme-service rear tank guard	225 lb. (102 kg)	225 lb. (102 kg)	225 lb. (102 kg)
Extreme-service air-conditioning module guard	117 lb. (53 kg)	117 lb. (53 kg)	117 lb. (53 kg)
Lights, driving	3 lb. (1 kg)	3 lb. (1 kg)	3 lb. (1 kg)
Work lights, high intensity	9 lb. (4 kg)	9 lb. (4 kg)	9 lb. (4 kg)
Parallelogram ripper with three teeth	2,400 lb. (1088 kg)	2,400 lb. (1088 kg)	2,400 lb. (1088 kg)
Retrieval hitch	68 lb. (31 kg)	68 lb. (31 kg)	68 lb. (31 kg)
Extended drawbar	195 lb. (88 kg)	195 lb. (88 kg)	195 lb. (88 kg)
Rock guards (4)	287 lb. (130 kg)	287 lb. (130 kg)	N/A
4000S John Deere Winch	1,437 lb. (652 kg)	1,437 lb. (652 kg)	1,437 lb. (652 kg)
Fairlead, four roller (for 4000S Winch)	187 lb. (85 kg)	187 lb. (85 kg)	187 lb. (85 kg)
Log arch (for 4000S Winch)	780 lb. (354 kg)	780 lb. (354 kg)	780 lb. (354 kg)


KOBELCO
235SR
10/14/2005

KOBELCO®

Your competitive edge.

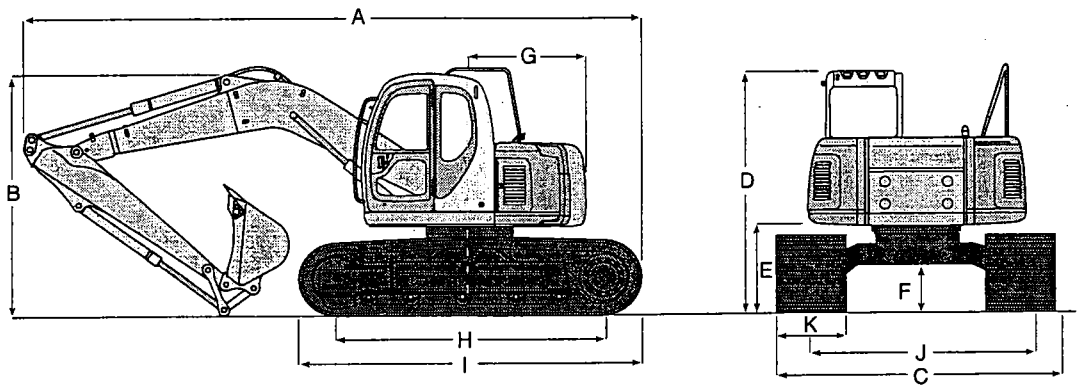
235SR$_{LC}$	
WT	*57,300 lb*
HP	*148 SAE NET*
BKT CAP	*.67-1.67 cu yd*



SHORT RADIUS Hydraulic Excavator

SPECS 235SRLC

WEIGHTS & DIMENSIONS



WEIGHTS

MODEL	235SRLC	235SRLC High & Wide
Overall Width ft-in (m)	11' 1" (3,390)	11' 11" (3,450)
Ground pressure psi (kPa)*	5.60 (0.39)	5.97 (0.42)
Operating weight lb (kg)	57,300lbs (26,000 kg)	60,640 (27,500)

* Ground pressure with standard (800 mm) shoes.

HYDRAULIC SYSTEM

Pumps	2 variable displacement
Max discharge flow	2 x 55 US gal/min (2 x 210 lit/min)
Max discharge pressures:	
Boom, arm & bucket	4,980 psi (350 kg/cm²)
Power boost	5,425 psi (385 kg/cm²)
Travel circuit	4,980 psi (350 kg/cm²)
Control circuit	710 psi (50 kg/cm²)
Swing pressure	4,135 psi (291 kg/cm²)
Control valves	6 spool

DIMENSIONS

Unit ft-in (m)

ARM LENGTH	9' 8"	(2.94)
A Overall length	29' 2"	(8.89)
B Overall height (to top of boom)	10' 4"	(3.16)
C Overall width	11' 1"	(3.39)
D Overall height (to top of cab)*	10' 2"	(3.09)
E Ground clearance of rear end*	3' 6"	(10.65)
F Ground clearance*	17.9"	(455 mm)
G Tail swing radius	5' 11"	(1.80)
H Tumbler distance	12' 8"	(3.85)
I Overall length of crawler	15' 3"	(4.65)
J Track gauge	8' 6"	(2.59)
K Shoe width	31.5"	(800 mm)

*Excludes height of grouser bar.

BUCKET SELECTION CHART

Bucket Duty	Capacity (SAE) Cubic Yard (m³)	Width Inches (m)	Weight lb (kg)	Arm ft-in (mm) 9' 8" (2.94m)
General Purpose	.88 (.672)	24" (.609)	1,165 (528)	H
	.91 (.695)	30" (.762)	1,325 (601)	H
	1.14 (.871)	36" (.914)	1,450 (658)	H
	1.37 (1.047)	42" (1.066)	1,651 (749)	M
	1.60 (1,223)	48" (1,219)	1,780 (807)	L
Heavy Duty	.68 (.519)	24" (.609)	1,250 (567)	H
	.91 (.695)	30" (.762)	1,420 (644)	H
	1.14 (.871)	36" (.914)	1,560 (708)	M
	1.37 (1.047)	42" (1.066)	1,651 (749)	L
	1.60 (1,223)	48" (1,219)	1,780 (807)	X
Severe Duty	0.63 (.481)	26" (.660)	1,455 (660)	H
	0.75 (.573)	31" (.787)	1,590 (721)	H
	0.88 (.672)	37" (.939)	1,790 (812)	M
	1.13 (.871)	43" (1.092)	2,000 (907)	L

H Used with material weight up to 3,000 lbs per cubic yard.
M Used with material weight up to 2,500 lbs per cubic yard.
L Used with material weight up to 2,000 lbs per cubic yard.
X Not recommended.

ATTACHMENT 7
Additional Photographs of Secondary Geomembrane Deployment

Attachment 7 – Preparation of subgrade

Attachment 7 – Subgrade prepared but rain delayed geomembrane deployment

Attachment 7 – Secondary geomembrane deployment. Panels 1 and 27 shown

Attachment 7 – Secondary geomembrane deployment. East sideslope installed

Attachment 7 – Secondary geomembrane deployed

Attachment 7 – Secondary geomembrane deployed. Project delayed due to rain

Attachment 7 – Secondary geocomposite deployed

Attachment 7 – Secondary geocomposite deployed

Attachment 7 – Secondary geocomposite deployed

Attachment 7 – Subgrade reworked prior to geomembrane deployed

Attachment 7 – Geomembrane deployed on west side of Section 8

Attachment 7 – Entire secondary geomembrane deployed

Attachment 7 – Secondary geomembrane tie-in in south west corner with Section 7

ATTACHMENT 8
Revised QES Secondary Geomembrane Repair Log (Sheet 5)

QUALITY ENVIRONMENTAL SERVICES

SECONDARY
GEOMEMBRANE REPAIR LOG

PAGE	5
PROJECT TITLE	Southeast County Capacity Expansion Section 8
PROJECT NO.	0844902001

DATE REPAIRED	REPAIR NO.	PANEL/ SEAM ID	LOCATION	SIZE OF REPAIR	TECH ID	MACH. NO.	DATE TESTED	TESTED BY	COMMENTS
09/29/05	102	27-28	CAP (175')	2 X 4 DT	VV	15	09/30/05	DN	EXT WELD - DT & CAP
10/03/05	75	45	20' S	2 X 4	AP	42	10/06/05	JB	
10/04/05	103	47-48	TOE OF N SLOPE	3 X 5	VV	15	10/06/05	JB	
10/04/05	104	48-49	2' N	3 X 5	VV	15	10/06/05	JB	AT N TRENCH
10/04/05	105	51-54	NW COR OF SLOPE	2 X 2	VV	15	10/06/05	JB	
10/04/05	106	52-53-54	NW COR OF SLOPE	2 X 4	VV	15	10/06/05	JB	NW CORNER SLOPE
10/04/05	107	50-51-54	20' N	2 X 2	VV	15	10/06/05	JB	BUTT SEAM WEST
10/04/05	108	54-55-50	BUTT	TWELD	VV	15	10/06/05	JB	BUTT SEAM WEST
10/04/05	109	55-56-50	BUTT	TWELD	VV	15	10/06/05	JB	BUTT SEAM WEST
10/04/05	110	56-57-50	BUTT	TWELD	VV	15	10/06/05	JB	BUTT SEAM WEST
10/04/05	111	57-58-50		TWELD	VV	15	10/06/05	JB	BUTT SEAM WEST
10/04/05	112	58-59-50	BUTT	TWELD	VV	15	10/06/05	JB	BUTT SEAM WEST
10/04/05	113	59-60-50	BUTT	TWELD	VV	15	10/06/05	JB	SLOPE
10/04/05	114	60-61-50	BUTT	TWELD	VV	15	10/06/05	JB	SLOPE
10/04/05	115	61-62-50	BUTT	TWELD	VV	15	10/06/05	JB	BUTT SEAM
10/06/05	116	46-47-63		3 X 4	VV	15	10/06/05	JB	
10/06/05	117	47-48-64		4 X 4	VV	15	10/06/05	JB	
10/06/05	118	47-63-64		2 X 2	VV	15	10/06/05	JB	
10/06/05	119	63-64		2 X 2	VV	15	10/06/05	JB	
10/03/05	120	63-64		2 X 3	AP	42	10/06/05	JB	
10/03/05	121	46-63		2 X 3	AP	42	10/06/05	JB	
10/03/05	122	46-63-TIE	TIE-IN	2 X 2	AP	42	10/06/05	JB	TIE-IN
10/06/05	123	49-64	5' FROM BUTT	1 X 1	AP	42	10/06/05	JB	
10/06/05	124	49-65	BUTT	1 X 1	AP	42	10/06/05	JB	
10/06/05	125	49-50-66	BUTT	2 X 3	AP	42	10/06/05	JB	BUTT SEAM

ATTACHMENT 9
Revised QES Secondary Non-Destructive Test Log (Sheet 6)

QUALITY ENVIRONMENTAL SERVICES

SECONDARY

NON-DESTRUCTIVE TEST LOG

PAGE	6
PROJECT TITLE	Southeast County Expansion Section - 8
PROJECT NO.	0844902001

DATE	SEAM NO.	TECH. I.D.	AIR TEST						PASS OR FAIL	VACUUM BOX P/F	WEATHER/ COMMENTS
			PRESSURE (PSI)			TIME					
			START	END	DROP	START	END	DURATION			
10/10/05	50-59	SKIP	30	29	1	2:11	2:16	5 MIN	PASS	N/A	S SIDE OF DT
10/10/05	50-60	SKIP	30	29	1	2:11	2:16	5 MIN	PASS	N/A	S SIDE OF DT
10/10/05	50-61	SKIP	30	29	1	2:11	2:16	5 MIN	PASS	N/A	S SIDE OF DT
10/10/05	50-62	SKIP	30	29	1	2:11	2:16	5 MIN	PASS	N/A	S SIDE OF DT
10/10/05	65-66	SKIP	30	30	0	2:40	2:45	5 MIN	PASS	N/A	WEST BUTT
10/10/05	65-67	SKIP	30	30	0	2:40	2:45	5 MIN	PASS	N/A	WEST BUTT
10/10/05	65-68	SKIP	30	30	0	2:40	2:45	5 MIN	PASS	N/A	WEST BUTT
10/10/05	65-69	SKIP	30	29	1	2:40	2:45	5 MIN	PASS	N/A	WEST BUTT
10/10/05	65-70	SKIP	30	30	0	2:40	2:45	5 MIN	PASS	N/A	WEST BUTT
10/10/05	65-71	SKIP	30	30	0	2:40	2:45	5 MIN	PASS	N/A	WEST BUTT
10/10/05	65-72	SKIP	30	30	0	2:40	2:45	5 MIN	PASS	N/A	WEST BUTT
10/10/05	65-73	SKIP	30	30	0	2:40	2:45	5 MIN	PASS	N/A	WEST BUTT
10/10/05	65-74	SKIP	30	30	0	2:40	2:45	5 MIN	PASS	N/A	WEST BUTT
10/10/05	65-75	SKIP	30	30	0	2:40	2:45	5 MIN	PASS	N/A	WEST BUTT
10/10/05	65-76	SKIP	30	30	0	2:40	2:45	5 MIN	PASS	N/A	WEST BUTT
09/29/05	26-TIE IN	KC	-	-	-	VBOX	VBOX	-	N/A	PASS	SOUTH TIE-IN
09/29/05	27- TIE IN	KC	-	-	-	VBOX	VBOX	-	N/A	PASS	SOUTH TIE-IN
09/29/05	28-TIE IN	KC	-	-	-	VBOX	VBOX	-	N/A	PASS	SOUTH TIE-IN
09/29/05	29- TIE IN	KC	-	-	-	VBOX	VBOX	-	N/A	PASS	SOUTH TIE-IN
09/29/05	30-TIE IN	KC	-	-	-	VBOX	VBOX	-	N/A	PASS	SOUTH TIE-IN
09/29/05	31-TIE IN	KC	-	-	-	VBOX	VBOX	-	N/A	PASS	SOUTH TIE-IN
09/29/05	34-TIE IN	KC	-	-	-	VBOX	VBOX	-	N/A	PASS	SOUTH TIE-IN
10/01/05	35-TIE IN	JB	-	-	-	VBOX	VBOX	-	N/A	PASS	SOUTH TIE-IN
10/01/05	36-TIE IN	JB	-	-	-	VBOX	VBOX	-	N/A	PASS	SOUTH TIE-IN

ATTACHMENT 10
Revised QES Primary Geomembrane Repair Log (Sheet 2)

QUALITY ENVIRONMENTAL SERVICES

PRIMARY

GEOMEMBRANE REPAIR LOG

PAGE	2
PROJECT TITLE	Southeast County Capacity Expansion Section 8
PROJECT NO.	0844902001

DATE REPAIRED	REPAIR NO.	PANEL/ SEAM ID	LOCATION	SIZE OF REPAIR	TECH ID	MACH. NO.	DATE TESTED	TESTED BY	COMMENTS
10/11/05	26	1-4-21	BUTT	2'	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	27	1	BOTTOM	1 X 1	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	28	21-26-2-1	BOTTOM	3'	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	29	27-3-2-26	10' S	3'	VV	15	10/11/05	DN	N CORNER
10/11/05	30	28-29-21	BUTT	6'	VV	15	10/11/05	DN	BUTT SEAM
10/11/05	31	28-21-TI	S BOTTOM	2 X 2	VV	15	10/11/05	DN	S TIE-IN
10/11/05	32	28-31-31A	2' S	2 X 2	VV	15	10/13/05	ST	
10/11/05	33	28-30-31	BUTT	6'	SS	24	10/11/05	DN	
10/11/05	34	28-29-30	BUTT	3'	VV	15	10/11/05	DN	BUTT SEAM
10/11/05	35	26-21	28' S	2 X 6	VV	15	10/11/05	DN	N TRENCH
10/11/05	36	32-30-31	BUTT	2'	SS	24	10/11/05	DN	BUTT SEAM
10/11/05	37	32-31-31A	BUTT	6'	VV	15	10/13/05	ST	6' FROM S TIE-IN
10/11/05	38	31A-32	S TIE-IN	TWELD	VV	15	10/13/05	ST	S TIE-IN
10/11/05	39	35-36	121' S	6'	TD	24	10/11/05	DN	N TRENCH
10/11/05	40	32-33-TI	BUTT	4'	VV	15	10/13/05	JB	S TIE-IN
10/11/05	41	33-34-TI	BUTT	4'	VV	15	10/13/05	JB	S TIE-IN
10/11/05	42	34-35-TI	BUTT	4'	VV	15	10/13/05	JB	S TIE-IN
10/11/05	43	36-37	TOP OF SLOPE	6'	TD	24	10/114/05	DN	
10/11/05	44	37-38	295' N	6'	TD	24	10/11/05	DN	FROM N SLOPE
10/11/05	45	41-42	TOP OF SLOPE	8'	TD	24	10/11/05	DN	N SLOPE
10/11/05	46	16	TOP OF SLOPE	2'	TD	24	10/11/05	DN	N SLOPE
10/11/05	47	38-39	100' N	4'	TD	24	10/11/05	DN	FROM N SLOPE
10/11/05	48	39-40	200' S	4'	TD	24	10/11/05	DN	FROM N SLOPE
10/11/05	49	40-41	8'	3"	TD	24	10/11/05	DN	FROM N SLOPE
10/11/05	50	40-41	18'	3"	TD	24	10/11/05	DN	FROM N SLOPE

ATTACHMENT 11
Revised QES Primary Geomembrane Repair Log (Sheet 1)

QUALITY ENVIRONMENTAL SERVICES

PRIMARY

GEOMEMBRANE REPAIR LOG

PAGE	1
PROJECT TITLE	Southeast County Capacity Expansion Section 8
PROJECT NO.	0844902001

DATE REPAIRED	REPAIR NO.	PANEL/ SEAM ID	LOCATION	SIZE OF REPAIR	TECH ID	MACH. NO.	DATE TESTED	TESTED BY	COMMENTS
10/11/05	1	2-1	E SLOPE TRENCH	3'	VV	15	10/11/05	DN	E SLP TOP OF TRENCH
10/11/05	2	13-14	2' E	3'	TD	24	10/11/05	DN	AT TRENCH
10/11/05	3	14-15	2' E	2' X 2'	TD	24	10/11/05	DN	AT TRENCH
10/11/05	4	23-24-TI	S TIE-IN	2' X 2'	VV	15	10/13/05	ST	S TIE-IN
10/11/05	5	23-24-25	5' N	2' X 6'	VV	15	10/13/05	ST	S TIE-IN
10/11/05	6	25-21-TI	S TIE-IN	5'	VV	15	10/13/05	ST	S TIE-IN
10/11/05	7	21-23-25	5' S	2'	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	8	22-23-21	BUTT	2'	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	9	20-22-21	BUTT	2'	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	10	19-20-21	BUTT	2'	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	11	18-19-21	BUTT	2'	VV	15	10/11/05	DN	S TIE-IN
10/11/05	12	17-18-21	BUTT	2'	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	13	16-17-21	BUTT	2'	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	14	15-16-21	BUTT	2'	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	15	14-15-21	BUTT	2'	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	16	13-14-21	BUTT	2'	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	17	12-13-21	N BUTT	22'	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	18	11-12-21	BUTT	6'	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	19	10-11-21	BUTT	2'	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	20	9-10-21	BUTT	2'	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	21	8-9-21	BUTT	6'	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	22	7-8-21	BUTT	22'	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	23	6-7-21	BUTT	1'	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	24	5-6-21	BUTT	2'	VV	15	10/11/05	DN	N BUTT SEAM
10/11/05	25	4-5-21	BUTT	2'	VV	15	10/11/05	DN	N BUTT SEAM

ATTACHMENT 12
Signed and Sealed QORE Test Reports

November 21, 2005

Jones Edmunds
324 South Hyde Park Avenue, Suite 250
Tampa, Florida 33606

Attention: Mr. Joseph O'Neill

Subject: Jones Edmunds Drainage Sand Evaluation
QORE Job No. 26669

Gentlemen:

QORE, Inc. has completed the laboratory testing on the soil samples sent by your office. The following tests were performed:

- Standard Proctor (ASTM D-698)
- Rigid Wall Permeability Test (ASTM D-2434)
- Sieve Analysis (ASTM D-422)

QORE, Inc. performs soil tests in general accordance with the applicable American Society for Testing and Materials (ASTM) or AASHTO procedures. These procedures are generally recognized as the basis for uniformity and consistency of test results in the geotechnical engineering profession. All the work is supervised by a qualified engineer. Attached are test results for your review.

QORE, Inc. appreciates the opportunity to provide these laboratory services. Please contact us if you have any questions concerning this report or if we may be of further service.

Respectfully submitted,
QORE, Inc.

Jim Hanson
Geotechnical Laboratory Supervisor

C. Scott Fletcher, P.E.
Chief Geotechnical Engineer
Reg. Ga. 16170

JH/CSF/rs
Enclosures

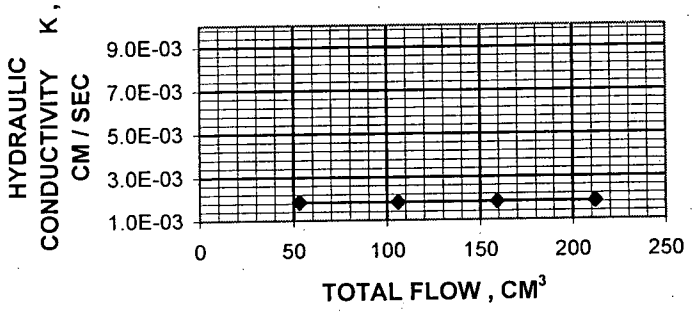
QORE
PROPERTY SCIENCES

RIGID WALL PERMEABILITY TEST REPORT
(ASTM D 2434)

AASHTO R18

REV$_0$,11/15/02

JOB NAME :	Jones Edmunds Drainage Sand Evaluation						
JOB NO. :	26669	REPORT NO:	-	*DATE :*	11/17/05	REVIEWED BY:	
BORING / PIT :	-	DEPTH / ELEV. :		SAMPLE NO. :	1	SAMPLE TYPE :	BULK
SAMPLE LOCATION :	-					SP. GRAVITY, G_s :	*2.73*
MATERIAL DESCRIPTION :	Brown sand						
D_{max}, MM :	-	D_{60}, MM :	-	D_{30}, MM :	-	D_{10}, MM :	-
CLASSIFICATION :		UNIFIED :	-	AASHTO :	-	FINES , % :	5



SPECIMEN FINAL PROPERTIES			
SPECIMEN DIAMETER	D	*4.0*	INCHES
SPECIMEN LENGTH	L	*4.7*	INCHES
DRY UNIT WEIGHT	γ_{dry}	*99*	PCF
VOID RATIO	e	*0.7*	
PERMEATION			
HYDRAULIC GRADIENT	i	*0.43*	
TEMPERATURE	T	*22*	°C
TOTAL FLOW	Q	*259*	CM^3

HYDRAULIC CONDUCTIVITY, k	
1.9E-03	cm/sec @ 20 °C

PERMEANT PROPERTIES
Tap Water @ 22 °C

REMOLDED SOIL PROPERTIES
Material was compacted in the mold to 95 % of dry density of 105.1pcf .

QORE
PROPERTY SCIENCES

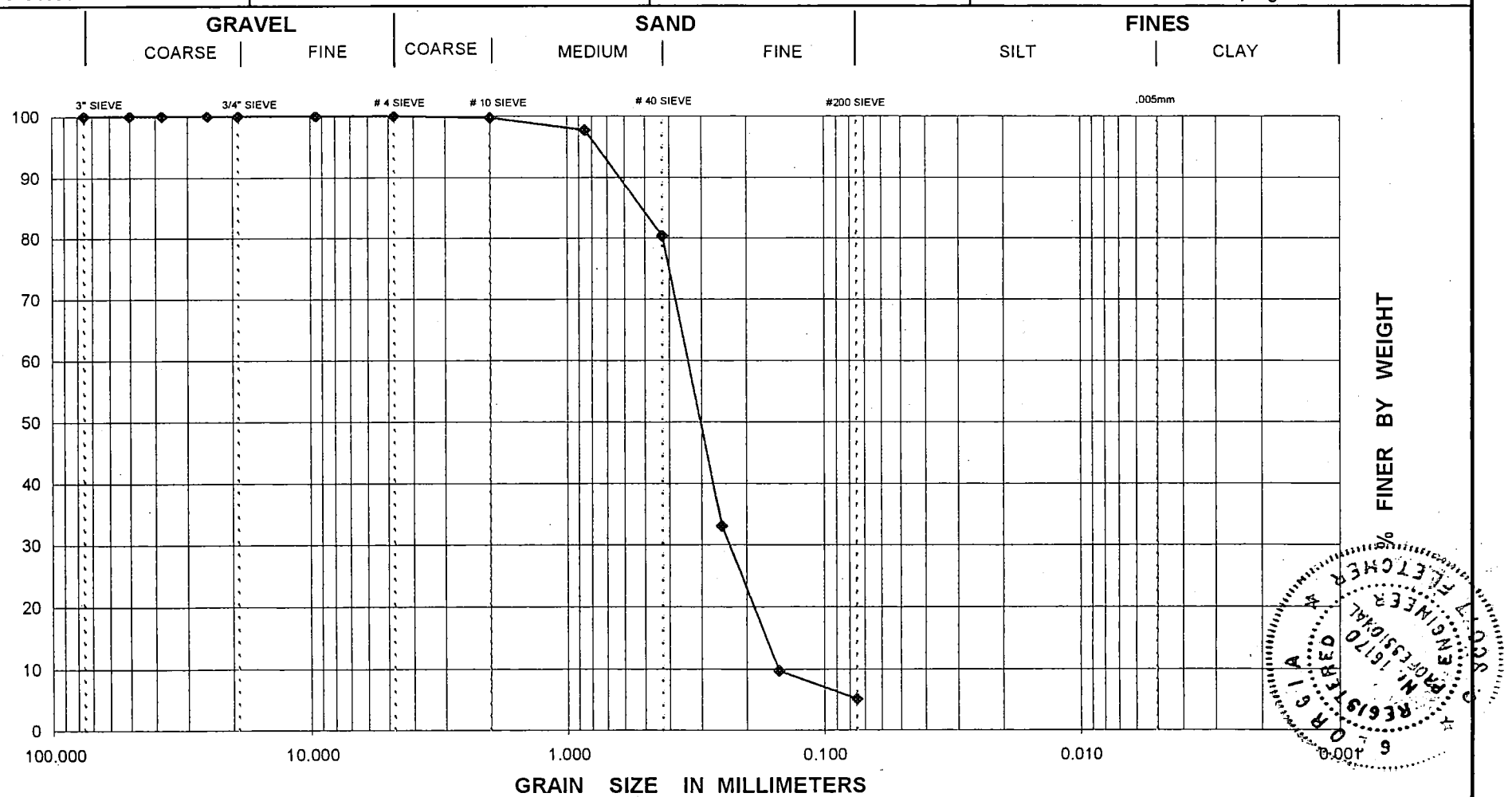
PARTICLE- SIZE DISTRIBUTION TEST REPORT

SIEVE AND HYDROMETER ASTM D422 0

AAR SM
AASHTO R18

REV1,9/17/03

JOB NAME :	*Jones Edmunds Drainage Sand Evaluation*						
JOB NO. :	*26669*	REPORT NO. :	-	DATE :	11/15/05	REVIEWED BY :	
BORING / PIT NO. :	-	DEPTH / ELEV. :	-	SAMPLE NO. :	*1*	SAMPLE TYPE :	*BULK*
SAMPLE LOCATION : -							
SOIL DESCRIPTION : *Brown sand*						SP. GRAVITY, Gs :	-
LIQUID LIMIT, % :	-	PLASTICITY INDEX , % :	-	MOISTURE , % :	-	FINES , % :	*5*
D10 , MM :	-	D30 , MM :	-	D60 , MM :	-	COEFF. OF CURVATURE , C_C :	-
CLASSIFICATION		UNIFIED :	-	AASHTO :	-	COEFF. OF UNIFORMITY , C_U :	-



REGISTERED PROFESSIONAL ENGINEER
No. 16170
STATE OF FLORIDA

QORE™ PROPERTY SCIENCES

Moisture/Density Relationship of Soil

11420 Johns Creek Parkway Duluth, GA 30097 (770) 476-3555 Fax (770) 476-0213

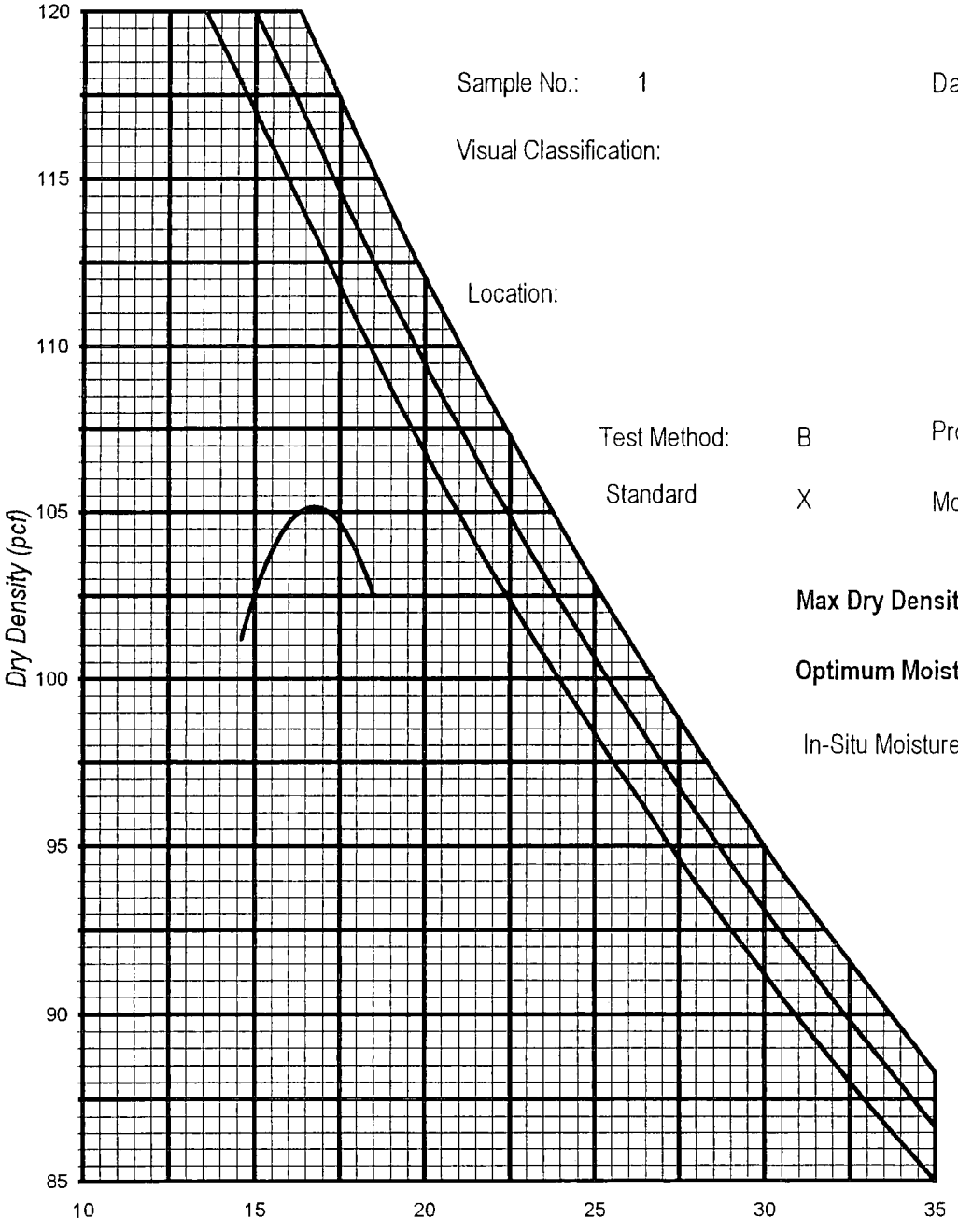
Project: JONES EDWARDS DRAINAGE SAND EVALUATION

Job No.: 26669

Report No.: 297950

Date: 11/17/2005

Client: JONES EDMUNDS



Sample No.: 1

Date Sampled: 11/16/2005

Visual Classification: BROWN SAND

Location:

Test Method: B Procedure: ASTM D-698

Standard X Modified

Max Dry Density: 105.1 pcf

Optimum Moisture: 16.7 %

In-Situ Moisture: %

Zero Air Voids Curve
Specific Gravity
2.80
2.70
2.60

Checked By_____

ATTACHMENT 13
Revised Record Drawing No. 9