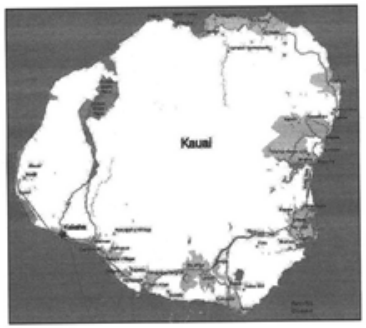
FEB 0 4 2009

ENGINEERING REPORT
PHASE II LATERAL EXPANSION
KEKAHA SANITARY LANDFILL

KAUAI, HAWAII

January 2009

Revision



VICINITY MAP

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SOURCE:
BASE MAP TAKEN FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE:
KAUA QUADRANGLE, HAWAI

LOCATION MAP

PREPARED FOR

COUNTY OF KAUAI, DEPARTMENT OF PUBLIC WORKS
4444 RICE STREET
LIHUE, KAUAI, 96766

KEKAHA LANDFILL
6900-A KAUMUALII HWY
KEKAHA, HAWAII
808-337-9213

PREPARED BY

AECOM
841 BISHOP STREET
SUITE 500
HONOLULU, HAWAII 96813-3920
808-523-8874

LEGEND

- EXISTING TOPOGRAPHY
- PROPERTY LINE
- EXISTING LIMITS OF WASTE
- MW-II-3 — EXISTING GROUNDWATER MONITORING WELL
- LCM-8 — EXISTING LEACHATE COLLECTION MANHOLE
- GP-II-4 — EXISTING GAS PROBE
- EXISTING LEACHATE PUMP STATION (WETWELL)
- EXISTING LEACHATE FORCEMAIN

NOTES:

1. TOPOGRAPHIC MAP PREPARED BY WALKER AND ASSOCIATES, SEATTLE, WASHINGTON. DATE OF FLIGHT: MAY 19, 2006 AND PORTIONS ARE ANTICIPATED TO BE UPDATED BASED ON GROUND SURVEY.
2. HORIZONTAL DATUM IS BASED ON NAD83 (1986), HAWAII ZONE 4. VERTICAL DATUM BASED ON LOCAL TIDAL.
3. CONTRACTOR TO STORE AND LOCATE CONSTRUCTION MATERIALS AND EQUIPMENT ON EXISTING PHASE I. ACTUAL LOCATION MAY VARY AT TIME OF CONSTRUCTION. GAIN OWNER/COUNTY APPROVAL FOR FINAL LOCATION. STORAGE AREAS WILL BE DESIGNATED BY THE COUNTY.
4. CONTRACTOR WHILE OPERATING ON PHASE I IS TO BE AWARE OF ALL STAND PIPES, MANHOLES, AND COVER FEATURES. REPAIR/REPLACE AT NO COST TO OWNER DAMAGED FEATURES.
5. LEACHATE FORCEMAIN, MANHOLES AND WET WELL LOCATIONS ARE APPROXIMATE AND ARE BASED UPON DRAWINGS TITLED, "KEKAHA SANITARY LANDFILL, PHASE 2, KEKAHA, HAWAII", PREPARED BY HARDING LAWSON ASSOCIATES, DATED MARCH 1993.
6. CONTRACTOR TO COORDINATE CONSTRUCTION TRAFFIC PATTERN FROM EQUIPMENT AND STORAGE AREAS WITH OWNER.

SCALE 0' 50' 100' 200'

NO	REVISIONS	DRN	K.JI	2/2009
1	ADDED EXISTING GAS PROBES	CHK		DATE

Shelbygrom, Wisconsin
DRN DRB
DES TDH/NKW
CHK K.JI
APP K.JI

PREPARED BY

AECOM

ENGINEERING REPORT
PHASE II LATERAL EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

EXISTING SITE CONDITIONS

DATE JANUARY 2009
PROJECT NO 95561
FILENAME 01Exist_Site.dgn
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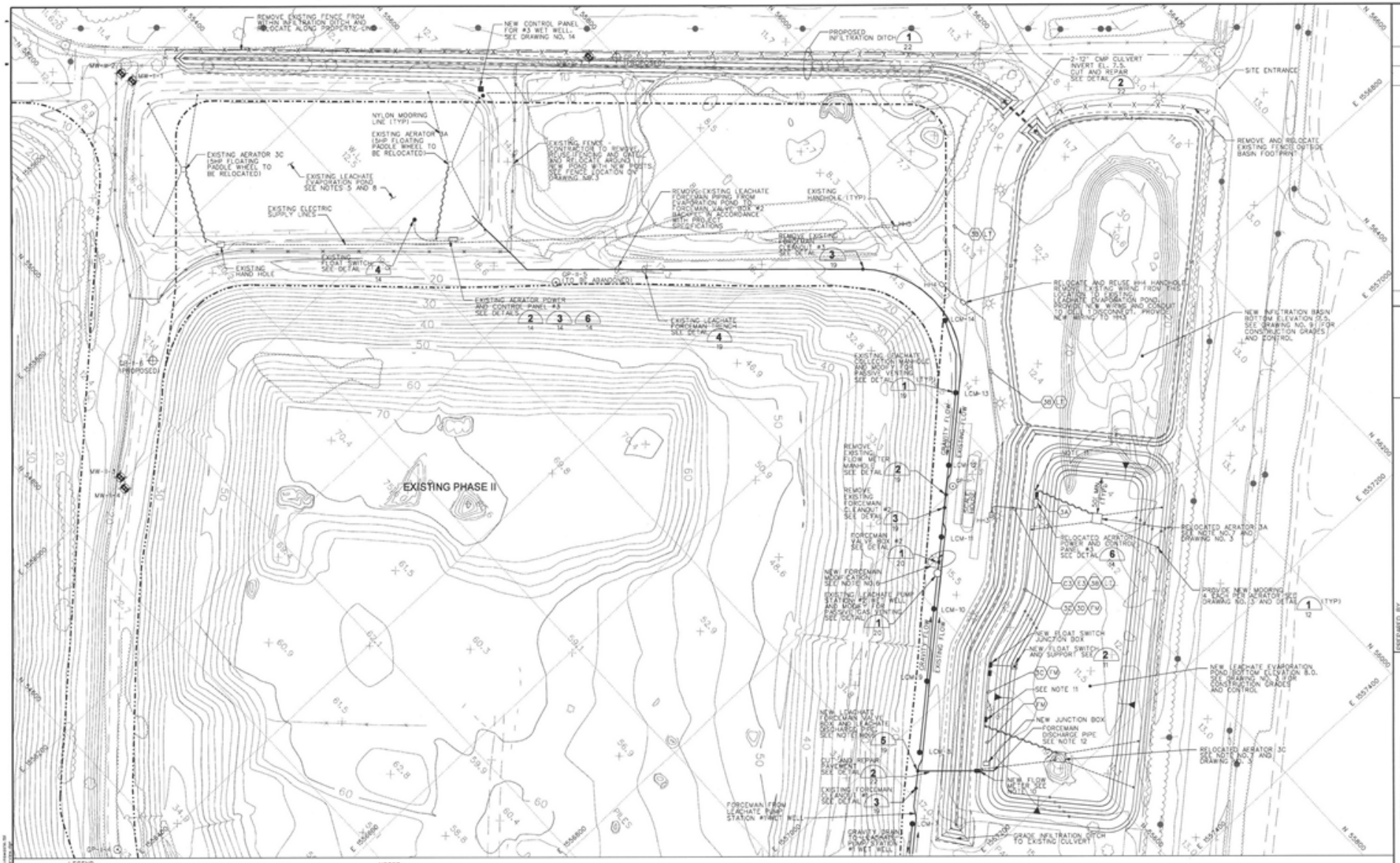
DRAWING NO 1



LEGEND

- EXISTING TOPOGRAPHY
- PROPERTY LINE
- EXISTING LIMITS OF WASTE
- MW-1-3 EXISTING GROUNDWATER MONITORING WELL
- LCM-8 EXISTING LEACHATE COLLECTION MANHOLE
- EXISTING LEACHATE PUMP STATION
- GP-1-4 EXISTING GAS PROBE
- GP-1-6 PROPOSED GAS PROBE
- EXISTING LEACHATE FORCEMAIN
- (YM) CIRCUIT NUMBER
- EXISTING ELECTRIC HANDHOLE

NOTES:

1. TOPOGRAPHIC MAP PREPARED BY WALKER AND ASSOCIATES, SEATTLE, WASHINGTON, DATE OF FLIGHT: MAY 19, 2006 AND PORTIONS ARE ANTICIPATED TO BE UPDATED BASED ON GROUND SURVEY.
2. HORIZONTAL DATUM IS BASED ON NAD83 (1986), HAWAII ZONE 4. VERTICAL DATUM BASED ON LOCAL TIDAL.
3. EXISTING LEACHATE MANAGEMENT SYSTEM, LAGOON AERATORS, AND ELECTRICAL SYSTEM ARE LOCATED APPROXIMATELY BASED UPON DRAWINGS TITLED "KEKAHA SANITARY LANDFILL PHASE II, KEKAHA, HAWAII", PREPARED BY HARDING LAWSON ASSOCIATES, DATED MARCH 1993.
4. CONTRACTOR TO CONSTRUCT NEW LEACHATE EVAPORATION POND AND OBTAIN APPROVAL FOR USE PRIOR TO DECOMMISSIONING AND REMOVAL OF EXISTING LEACHATE EVAPORATION POND.
5. EXISTING LEACHATE EVAPORATION POND CONSTRUCTION DETAILS DEPICTED ON DRAWING NO. 10.
6. EXISTING FORCEMAIN FLOWS FROM PUMP STATION #1 WET WELL TO PUMP STATION #2 WET WELL FOR COMBINED FLOW TO THE EXISTING LEACHATE EVAPORATION POND AS SHOWN ON DETAIL 1/20.

   REVISED FLOW FROM PUMP STATION #1 WET WELL AND PUMP STATION #2 WET WELL WILL BE TO NEW LEACHATE VALVE BOX EAST OF LCM-8. MODIFY EXISTING FORCEMAIN PIPING AT PUMP STATION #2 WET WELL PER DETAIL 1/20 AND INSTALL NEW LEACHATE FORCEMAIN VALVE BOX.
7. ORIENTATE AERATOR AND PADDLES TO FACE EACH OTHER. AERATORS TO BE PLACED ON CONCRETE PADS SHOWN ON DETAILS 1/13 AND 2/13.
8. CONTRACTOR TO DISPOSE OF ALL COMPONENTS OF EXISTING LEACHATE EVAPORATION BASE LINER IN EXISTING PHASE I AS DESIGNATED BY OWNER/SANIFIL.
9. INSTALL PASSIVE GAS VENTS ON ALL LEACHATE COLLECTION MANHOLES AND PUMP STATION WET WELLS PER DRAWINGS NO.19 AND NO.20.
10. REFER TO SPECIFICATIONS FOR FLOW METER TYPE. LOCATE METER ON OUTBOUND SLOPE OF POND.
11. AERATOR DISCONNECT AND TERMINATION OF AERATOR CABLE.
12. PROTECT GEOCELL AND GRANULAR FILL ON POND SIDESLOPE WITH HDPE SUBSHEET BELOW PIPE TO TOE OF SLOPE. SECURE SUBSHEET TO GEOCELL WITH MANUFACTURER APPROVAL OR WEIGH EDGES WITH CONCRETE BLOCKS.

SCALE 0' 30' 60' 120'

NO	REVISIONS	DRN	CHK	DATE
1	REVISED AERATOR PAD LOCATIONS AND CALLOUTS	DRB	KJB	2/2009
2	ADDED EXISTING AND PROPOSED GAS PROBES	DRB	KJB	2/2009

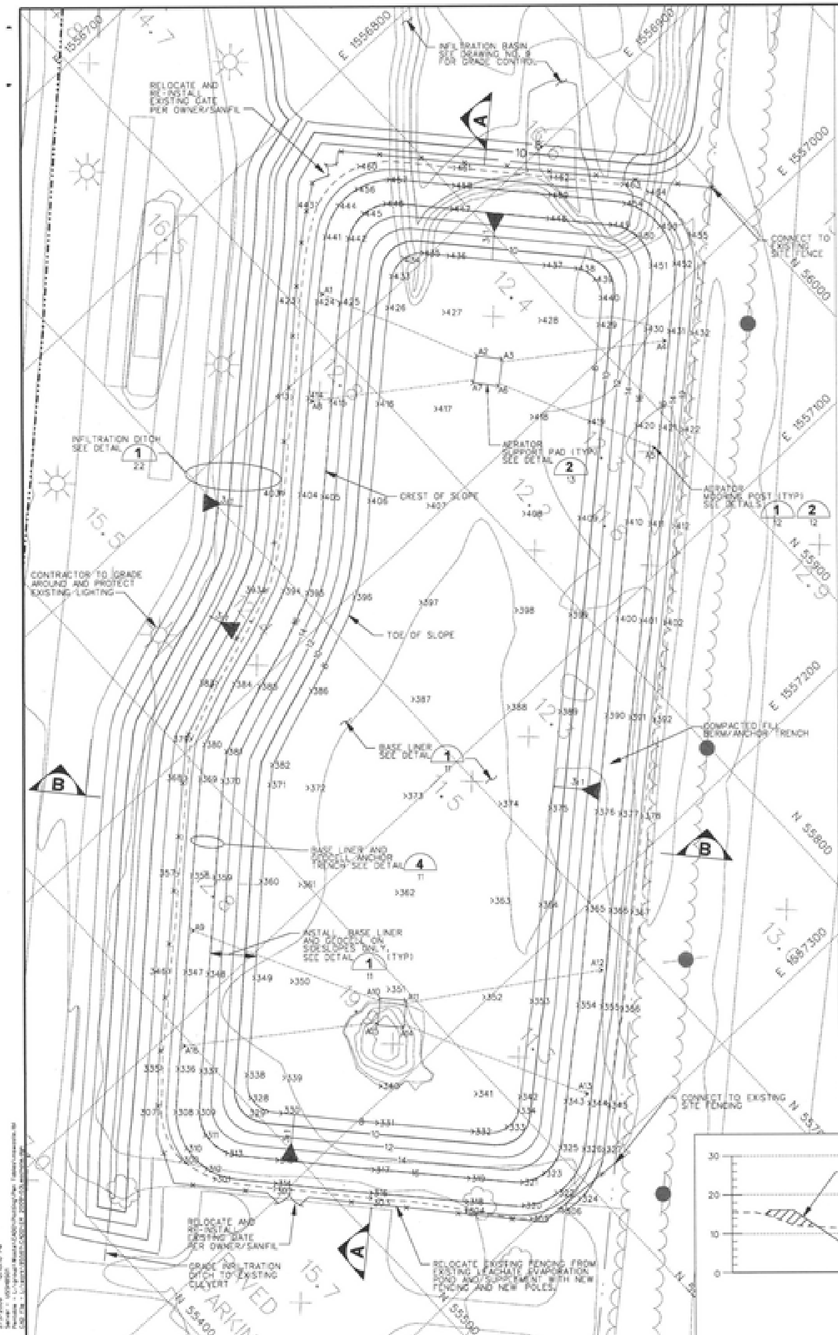
Shelboygan, Wisconsin
DRN DRB
DES TDK/NCW
CHK KJB
APP KJB

PREPARED BY AECOM

ENGINEERING REPORT
PHASE II LATERAL EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

PROJECT OVERVIEW

DATE JANUARY 2009
PROJECT NO 95561
FILENAME 02Proj-overview.dgn
SHEET NO
DRAWING NO 2



LEGEND

EXISTING TOPOGRAPHY

TOP OF SUBGRADE (FLOOR) OR FOUNDATION LAYER (SIDESLOPES)

PROPERTY LINE

EXISTING LIMITS OF WASTE

>350 CONTROL POINT

NOTES:

1. TOPOGRAPHIC MAP PREPARED BY WALKER AND ASSOCIATES, SEATTLE, WASHINGTON. DATE OF FLIGHT MAY 19, 2006 AND PORTIONS ARE ANTICIPATED TO BE UPDATED BASED ON GROUND SURVEY.
2. HORIZONTAL DATUM IS BASED ON NAD83 (1986), HAWAII ZONE 4. VERTICAL DATUM BASED ON LOCAL TIDAL.
3. GRADES REPRESENT TOP OF SUBGRADE SURFACE PRIOR TO BASE LINER INSTALLATION. SEE DETAIL 1/11

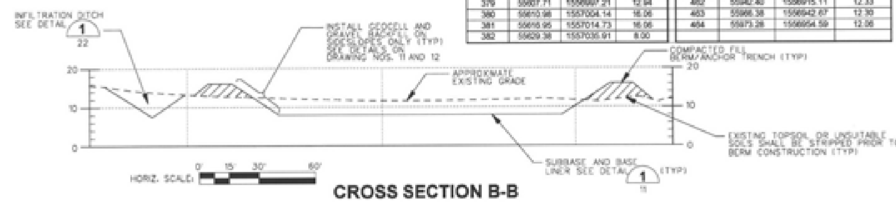
SCALE 0' 15' 30' 60'

Aerator Pad and Mooring Post Control Points

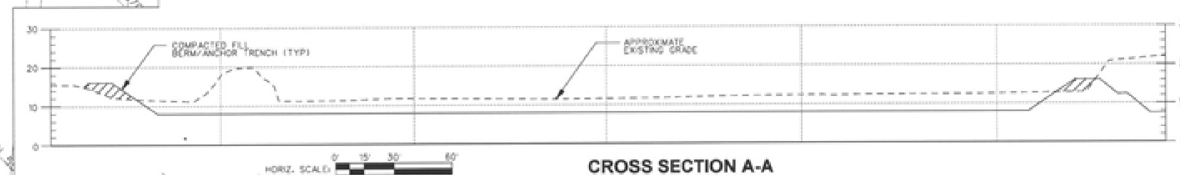
Point	Northing	Easting
A1	55814.52	1556877.07
A2	55851.02	1556955.15
A3	55859.22	1556965.24
A4	55926.75	1557015.84
A5	55884.98	1557052.42
A6	55848.36	1556974.07
A7	55840.16	1556963.98
A8	55772.86	1556913.55
A9	55540.69	1557089.65
A10	55587.82	1557161.61
A11	55664.68	1557171.38
A12	55680.99	1557229.73
A13	55631.87	1557271.08
A14	55585.67	1557180.61
A15	55577.10	1557170.84
A16	55498.71	1557109.88

Leachate Evaporation Pond Control Points

Point	Northing	Easting	Elevation	Point	Northing	Easting	Elevation
300	55455.42	1557151.74	13.73	383	55637.84	1556985.91	12.83
301	55461.71	1557171.16	14.96	384	55643.61	1556992.31	16.06
302	55480.92	1557195.06	14.89	385	55652.42	1557002.10	16.06
303	55513.78	1557233.76	14.92	386	55670.24	1557021.94	8.00
304	55545.51	1557272.47	14.13	387	55705.54	1557061.09	8.00
305	55566.87	1557298.13	13.13	388	55739.00	1557098.25	8.00
306	55581.88	1557307.04	12.07	389	55756.97	1557118.24	8.00
307	55464.52	1557126.53	12.90	390	55773.17	1557136.20	16.06
308	55470.13	1557131.89	16.06	391	55781.20	1557145.12	16.06
309	55478.89	1557140.10	16.06	392	55789.43	1557154.26	11.08
310	55461.48	1557149.29	16.06	393	55688.86	1556967.85	12.80
311	55473.35	1557151.08	16.06	394	55694.88	1556974.52	16.06
312	55461.99	1557164.22	16.06	395	55703.24	1556983.81	16.06
313	55475.38	1557165.90	16.06	396	55719.82	1557002.31	8.00
314	55482.98	1557194.21	16.06	397	55742.70	1557027.64	8.00
315	55491.90	1557186.18	16.06	398	55776.16	1557064.79	8.00
316	55515.80	1557231.94	16.06	399	55794.92	1557085.66	8.00
317	55524.71	1557223.91	16.06	400	55811.13	1557103.63	16.06
318	55548.99	1557289.33	16.06	401	55819.15	1557112.55	16.06
319	55557.91	1557261.30	16.06	402	55827.98	1557121.88	10.98
320	55568.63	1557290.57	16.06	403	55729.39	1556938.20	12.58
321	55576.27	1557281.32	16.06	404	55735.13	1556944.51	16.06
322	55585.63	1557297.69	16.06	405	55743.16	1556953.43	16.06
323	55587.76	1557285.86	16.06	406	55758.34	1556971.40	8.00
324	55592.39	1557308.09	11.94	407	55779.86	1556994.18	8.00
325	55603.01	1557282.07	16.06	408	55813.31	1557031.34	8.00
326	55611.35	1557290.84	16.06	409	55832.65	1557052.82	8.00
327	55618.64	1557298.00	11.95	410	55848.83	1557070.79	16.06
328	55503.70	1557153.34	8.00	411	55856.86	1557079.71	16.06
329	55505.37	1557164.55	8.00	412	55865.14	1557088.90	11.05
330	55509.88	1557170.00	8.00	413	55766.93	1556905.10	12.72
331	55542.68	1557207.73	8.00	414	55772.42	1556911.20	16.06
332	55575.87	1557245.11	8.00	415	55780.45	1556920.11	16.06
333	55589.97	1557255.36	8.00	416	55796.70	1556938.02	8.00
334	55600.00	1557253.02	8.00	417	55817.01	1556960.72	8.00
335	55480.80	1557110.39	12.72	418	55850.47	1556997.88	8.00
336	55486.30	1557116.49	16.06	419	55870.28	1557019.86	8.00
337	55494.42	1557125.51	16.06	420	55886.45	1557037.84	16.06
338	55510.56	1557143.56	8.00	421	55894.83	1557047.15	15.85
339	55523.46	1557157.78	8.00	422	55902.43	1557055.58	11.25
340	55556.91	1557194.92	8.00	423	55803.84	1556871.37	12.32
341	55590.37	1557232.08	8.00	424	55810.90	1556878.21	16.06
342	55605.56	1557248.52	8.00	425	55817.97	1556887.06	16.06
343	55621.54	1557266.70	16.06	426	55834.22	1556905.13	8.00
344	55629.57	1557275.62	16.06	427	55854.17	1556927.27	8.00
345	55636.42	1557283.22	11.91	428	55887.63	1556964.43	8.00
346	55517.85	1557076.82	12.78	429	55907.94	1556986.87	8.00
347	55523.25	1557082.80	16.06	430	55924.77	1557005.59	16.06
348	55531.28	1557091.72	16.06	431	55932.10	1557013.81	16.06
349	55547.54	1557109.63	8.00	432	55940.19	1557022.81	11.18
350	55580.61	1557124.31	8.00	433	55846.77	1556894.80	8.00
351	55594.07	1557161.46	8.00	434	55857.33	1556882.23	8.00
352	55627.53	1557198.62	8.00	435	55866.67	1556897.24	8.00
353	55644.03	1557216.91	8.00	436	55875.84	1556907.76	8.00
354	55660.19	1557234.90	16.06	437	55908.71	1556945.48	8.00
355	55668.22	1557243.81	16.06	438	55919.64	1556958.07	8.00
356	55675.27	1557251.64	11.79	439	55922.67	1556968.48	8.00
357	55555.13	1557043.49	13.11	440	55918.45	1556977.59	8.00
358	55559.97	1557048.87	16.06	441	55835.93	1556856.79	16.06
359	55568.01	1557057.79	16.06	442	55844.14	1556865.65	16.06
360	55584.15	1557075.80	8.00	443	55844.62	1556841.94	12.42
361	55597.77	1557090.85	8.00	444	55851.87	1556849.99	16.06
362	55631.23	1557128.01	8.00	445	55858.43	1556861.62	16.06
363	55664.68	1557165.16	8.00	446	55869.98	1556865.46	16.06
364	55681.39	1557183.87	8.00	447	55893.81	1556891.58	16.06
365	55697.66	1557201.79	16.06	448	55926.66	1556929.28	16.06
366	55705.69	1557210.71	16.06	449	55948.06	1556953.64	16.06
367	55713.04	1557218.87	11.61	450	55953.40	1556966.61	16.06
368	55592.33	1557010.08	13.09	451	55948.42	1556983.10	16.06
369	55597.20	1557015.50	16.06	452	55957.79	1556990.60	16.06
370	55605.24	1557024.42	16.06	453	55965.41	1556971.20	16.06
371	55621.40	1557042.40	8.00	454	55960.46	1556950.59	16.06
372	55634.93	1557057.39	8.00	455	55973.90	1556985.52	11.53
373	55668.39	1557094.55	8.00	456	55964.80	1556930.42	16.06
374	55701.84	1557131.71	8.00	457	55879.67	1556857.75	16.06
375	55719.17	1557150.93	8.00	458	55902.73	1556883.55	16.06
376	55735.34	1557168.92	16.06	459	55935.55	1556921.27	16.06
377	55743.38	1557177.84	16.06	460	55973.55	1556842.53	12.38
378	55750.97	1557186.27	11.46	461	55909.42	1556877.26	12.33
379	55607.71	1556997.21	12.94	462	55942.40	1556915.11	12.33
380	55610.98	1557004.14	16.06	463	55966.38	1556942.67	12.30
381	55616.95	1557014.73	16.06	464	55973.28	1556954.59	12.06
382	55629.38	1557035.91	8.00				



CROSS SECTION B-B



CROSS SECTION A-A

NO	REVISIONS	DRN	CHK	DATE
1	ADDED AERATOR AND POST SURVEY CONTROL	KJB	KJB	2/2009

Sheboygan, Wisconsin

DRN DRB | DES TDR/KRE | CHK KJB | APP KJB

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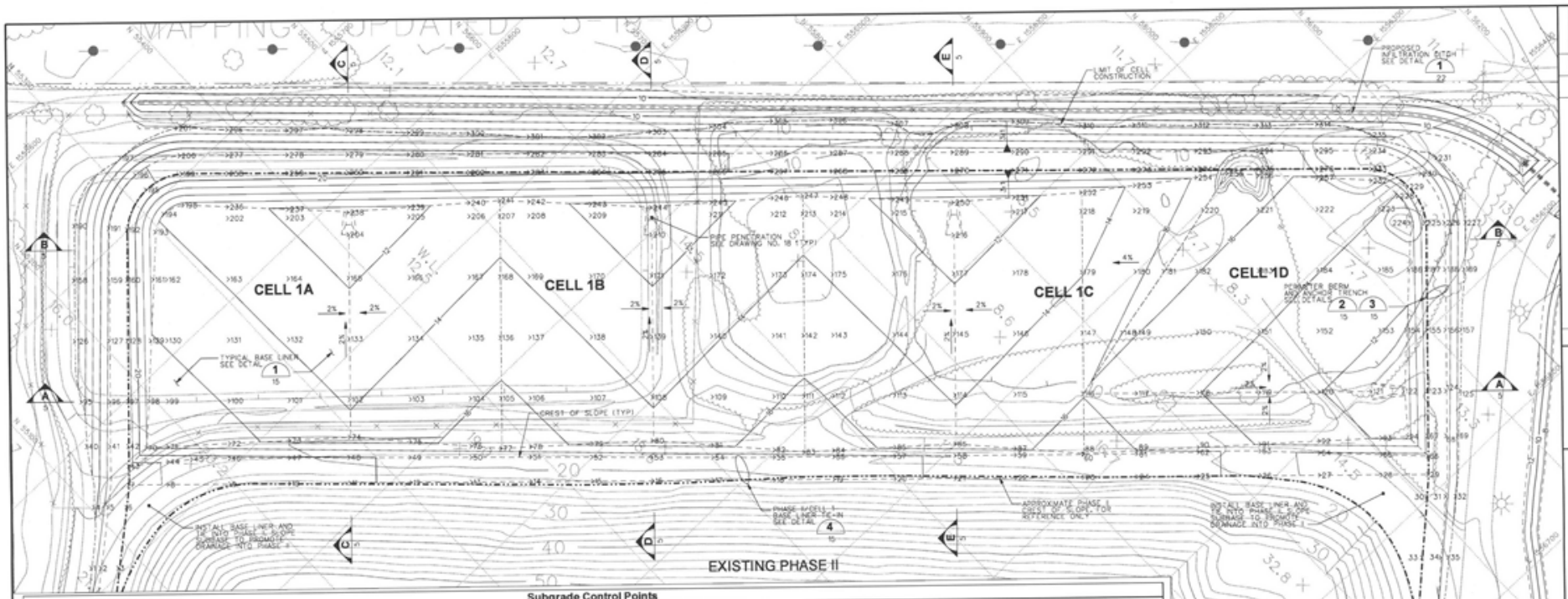
AECOM

PREPARED BY

ENGINEERING REPORT
PHASE II LATERAL EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

LEACHATE EVAPORATION POND GRADES AND CROSS SECTIONS

DATE JANUARY 2009
PROJECT NO 95561
FILENAME 03.Leachate.dgn
SHEET NO
DRAWING NO 3



Subgrade Control Points

Point	Northing	Easting	Elevation
1	55067.14	1555880.55	20.83
2	55072.82	1555885.88	23.38
3	55083.12	1555895.56	23.37
4	55103.12	1555845.75	19.43
5	55111.44	1555853.56	23.17
6	55122.45	1555863.91	23.16
7	55136.32	1555852.08	23.08
8	55160.85	1555875.07	21.76
9	55197.32	1555909.28	20.60
10	55233.75	1555943.52	20.31
11	55270.19	1555977.76	20.08
12	55306.63	1556011.99	19.89
13	55343.07	1556046.23	19.69
14	55379.50	1556080.47	19.49
15	55415.94	1556114.71	19.30
16	55452.38	1556148.95	19.16
17	55488.82	1556183.19	19.02
18	55525.25	1556217.43	18.77
19	55561.69	1556251.67	18.45
20	55598.13	1556285.91	18.14
21	55634.57	1556320.15	17.83
22	55671.00	1556354.39	17.52
23	55711.29	1556392.24	17.17
24	55743.88	1556422.86	16.82
25	55780.31	1556457.10	16.21
26	55816.75	1556491.34	15.81
27	55853.18	1556525.60	16.10
28	55889.60	1556559.85	16.39
29	55917.48	1556586.06	16.61
30	55904.06	1556598.36	16.53
31	55915.03	1556608.66	16.54
32	55921.05	1556614.32	13.82
33	55868.91	1556632.09	16.32
34	55877.89	1556642.38	16.32
35	55882.54	1556646.75	14.23
36	55829.80	1556665.80	16.11
37	55840.76	1556676.10	16.11
38	55817.95	1556676.55	16.04
39	55828.04	1556687.66	16.04
40	55133.50	1555805.68	16.67
41	55147.36	1555818.70	22.95
42	55158.29	1555828.97	22.95
43	55147.10	1555840.88	23.02
44	55173.69	1555861.41	21.73
45	55189.16	1555873.35	20.98
46	55211.83	1555893.83	20.60
47	55248.24	1555928.10	20.31
48	55284.13	1555962.12	20.08
49	55320.35	1555996.60	19.89
50	55356.96	1556031.44	19.69
51	55393.33	1556065.76	19.42
52	55426.99	1556100.02	19.31
53	55465.10	1556134.61	19.16
54	55501.61	1556169.57	19.02
55	55537.94	1556203.93	18.77
56	55574.40	1556238.14	18.45
57	55610.85	1556272.36	18.14
58	55647.31	1556306.58	17.83
59	55683.77	1556340.80	17.52
60	55724.06	1556378.63	17.17
61	55756.83	1556409.08	16.82
62	55793.88	1556442.67	16.21
63	55830.64	1556476.56	15.76
64	55865.71	1556512.26	16.13
65	55900.89	1556547.84	16.43
66	55937.19	1556583.53	16.67
67	55939.35	1556582.91	16.74
68	55850.28	1556573.18	16.74
69	55857.22	1556579.79	13.60
70	55168.15	1555840.35	17.96
71	55182.17	1555852.38	17.58
72	55290.19	1555884.94	16.53
73	55258.15	1555917.55	15.49
74	55296.11	1555950.17	14.44
75	55329.70	1555987.44	15.53
76	55363.29	1556024.71	16.61
77	55380.09	1556043.34	17.15
78	55399.07	1556059.65	16.63
79	55437.01	1556092.27	15.59
80	55474.99	1556124.88	14.54
81	55508.58	1556162.15	15.62
82	55542.17	1556199.42	16.71
83	55558.97	1556218.06	17.25
84	55577.95	1556234.37	16.73
85	55615.91	1556266.98	15.68
86	55653.87	1556299.60	14.64
87	55687.45	1556336.87	15.72
88	55724.61	1556378.08	16.92
89	55758.55	1556407.25	15.98
90	55796.51	1556439.87	14.94
91	55834.47	1556472.48	13.89
92	55872.44	1556505.10	12.85
93	55910.40	1556537.72	11.81
94	55927.22	1556552.17	11.34
95	55155.45	1555775.91	15.07
96	55172.51	1555791.94	22.79
97	55183.44	1555802.21	22.79
98	55196.15	1555814.15	17.15
99	55207.80	1555825.10	16.83
100	55244.24	1555859.34	15.83
101	55280.68	1555893.58	14.83
102	55317.12	1555927.82	13.83
103	55353.55	1555962.06	14.83
104	55389.99	1555996.29	15.83
105	55406.21	1556013.41	16.33
106	55426.43	1556030.53	15.83
107	55462.87	1556064.77	14.83
108	55499.30	1556099.01	13.83
109	55535.74	1556133.25	14.83
110	55572.18	1556167.49	15.83
111	55590.40	1556184.61	16.33
112	55608.62	1556201.73	15.83
113	55645.05	1556235.97	14.83
114	55681.49	1556270.21	13.83
115	55717.93	1556304.45	14.83
116	55758.22	1556342.31	15.94
117	55790.80	1556372.92	15.04
118	55827.24	1556407.16	14.04
119	55863.68	1556441.40	13.04
120	55900.12	1556475.64	12.04
121	55936.54	1556504.23	11.21
122	55950.52	1556523.00	10.50
123	55964.50	1556536.15	16.90
124	55976.44	1556548.42	16.90
125	55983.90	1556554.37	13.06
126	55185.96	1555735.96	13.17
127	55206.75	1555755.50	22.58
128	55217.68	1555765.77	22.58
129	55231.83	1555779.07	16.11
130	55342.04	1555788.66	15.83
131	55278.48	1555822.90	14.83
132	55314.92	1555857.14	13.83
133	55351.36	1555891.38	12.83
134	55387.79	1555925.62	13.83
135	55404.25	1555959.86	14.83
136	55442.45	1555976.98	15.33
137	55460.67	1555994.10	14.83
138	55497.11	1556028.34	13.83
139	55533.54	1556062.57	12.83
140	55569.98	1556096.81	13.83
141	55606.42	1556131.05	14.83
142	55624.64	1556148.17	15.33
143	55642.86	1556165.29	14.83
144	55679.29	1556199.53	13.83
145	55715.73	1556233.77	12.83
146	55752.17	1556268.01	13.83
147	55792.46	1556305.87	14.94
148	55816.75	1556328.70	16.27
149	55825.04	1556336.49	16.04
150	55861.48	1556370.73	15.04
151	55897.92	1556404.97	14.04
152	55934.35	1556439.20	13.04
153	55970.79	1556473.44	12.04
154	55986.71	1556488.40	11.60
155	55998.74	1556499.71	17.11
156	56009.67	1556509.98	17.11
157	56018.97	1556518.71	12.90
158	55219.91	1555699.25	12.83
159	55240.99	1555719.06	22.37
160	55251.92	1555729.33	22.37
161	55267.91	1555744.35	15.06
162	55276.28	1555753.22	14.83
163	55312.72	1555786.46	13.83
164	55349.16	1555820.70	12.83
165	55385.59	1555854.94	11.83
166	55422.03	1555889.18	12.83
167	55458.47	1555923.42	13.83
168	55476.69	1555940.54	14.33
169	55494.91	1555957.66	13.83
170	55531.34	1555991.90	12.83
171	55567.78	1556026.14	11.83
172	55604.22	1556060.38	12.83
173	55640.66	1556094.62	13.83
174	55658.88	1556111.73	14.33
175	55677.09	1556128.85	13.83
176	55713.53	1556163.09	12.83
177	55749.97	1556197.33	11.83
178	55786.41	1556231.57	12.83
179	55826.70	1556269.43	13.94
180	55868.26	1556300.95	15.72
181	55875.28	1556315.98	16.60
182	55895.72	1556334.29	16.04
183	55932.16	1556368.53	15.04
184	55968.59	1556402.77	14.04
185	56005.03	1556437.01	13.04
186	56022.58	1556453.49	12.56
187	56032.98	1556463.27	17.32
188	56043.91	1556473.54	17.32
189	56055.40	1556484.34	12.12
190	55250.82	1555667.12	12.72
191	55270.28	1555688.23	22.20
192	55280.29	1555699.41	22.20
193	55296.19	1555717.15	14.26
194	55311.25	1555711.43	13.84
195	55314.36	1555688.85	22.04
196	55316.42	1555671.70	22.04
197	55316.95	1555653.16	15.91
198	55328.29	1555717.20	13.35
199	55344.81	1555697.53	21.90
200	55354.15	1555685.80	21.90
201	55368.10	1555667.76	14.38
202	55346.96	1555750.03	12.83
203	55383.40	1555784.27	11.83
204	55419.11	1555826.85	11.11
205	55456.27	1555852.74	11.83
206	55492.71	1555886.98	12.83
207	55510.93	1555904.10	13.33
208	55529.15	1555921.22	12.83
209	55565.58	1555955.46	11.83
210	55590.84	1556001.60	11.16
211	55638.46	1556023.94	11.83
212	55674.90	1556058.18	12.83
213	55693.11	1556075.30	13.33
214	55711.33	1556092.42	12.83
215	55747.77	1556126.66	11.83
216	55771.57	1556174.34	11.20
217	55820.65	1556195.13	11.83
218	55860.94	1556232.99	12.94
219	55893.52	1556263.61	14.72
220	55933.81	1556301.47	16.94
221	55966.40	1556332.09	16.04
222	56002.83	1556366.33	15.04
223	56039.27	1556400.57	14.04
224	56049.73	1556426.54	13.30
225	56058.39	1556434.77	17.24
226	56069.90	1556445.58	17.47
227	56082.65	1556457.56	11.71
228	56058.00	1556403.91	13.93
229	56069.09	1556403.67	17.62
230	56084.09	1556403.20	17.61
231	56102.21	1556402.64	11.63
232	56050.22	1556378.90	14.64
233	56056.62	1556372.00	17.77
234	56066.94	1556361.02	17.77
235	56075.86	1556351.52	13.48
236	55353.46	1555743.10	12.64
237	55368.24	1555779.11	11.69
238	55422.52	1555815.64	10.50
239	55461.66	1555853.91	11.67
240	55500.31	1555878.89	12.61
241	55519.64	1555894.83	13.08
242	55537.02	1555912.84	12.60
243	55571.80	1555948.85	11.65
244	55606.17	1555985.29	10.50
245	55645.22	1556016.74	11.63
246	55683.67	1556048.62	12.57
247	55703.20	1556064.57	13.04
248	55720.59	1556082.57	12.56
249	55755.36	1556118.58	11.61
250	55788.81	1556154.93	10.50
251	55828.78	1556188.47	11.59
252	55871.52	1556221.73	12.63
253	55907.82	1556248.40	14.31
254	55948.37	1556278.19	16.18
255	55968.92	1556293.31	17.14
256	55981.61	1556311.80	16.60
257	56020.58	1556347.44	15.56
258	55372.17	1555723.20	21.74
259	55408.46	1555757.59	21.53
260	55445.13	1555791.58	21.32
261	55481.05	1555826.37	21.11
262	55517.35	1555860.76	20.90
263	55553.64	1555895.15	20.69
264	55589.94	1555929.54	20.48
265	55626.24	1555963.93	20.27
266	55662.53	1555998.32	20.06
267	55698.83	1556032.71	19.85
268	55735.12	1556067.10	19.64
269	55771.41	1556101.48	19.43
270	55807.71	1556135.88	19.22
271	55844.01	1556170.27	19.00
272	55884.14	1556208.29	18.77
273	55916.57	1556239.01	18.56
274	55952.88	1556273.42	18.37
275	55989.19	1556307.83	18.16
276	56025.49	1556342.22	17.95
277	55382.44	1555712.27	21.74
278	55418.73	1555746.66	21.53
279	55455.03	1555781.05	21.32
280	55491.32	1555815.44	21.11
281	55527.62	1555849.83	20.90
282	55563.92	1555884.22	20.69
283	55600.21	1555918.61	20.48
284	55636.51	1555953.00	20.27
285	55672.76	1555987.34	20.06
286	55709.09	1556021.77	19.85
287	55745.34	1556056.12	19.64
288	55781.69	1556090.56	19.43
289	55817.99	1556124.95	19.22
290	55854.28	1556159.34	19.00
291	55894.42	1556197.36	18.77
292	55926.87	1556228.12	18.56
293	55963.17	1556262.51	18.37
294	55999.47	1556296.90	18.16
295	56035.76	1556331.29	17.95
296	55396.83	1555698.95	14.81
297	55432.57	1555731.93	14.87
298	55468.66	1555766.55	14.76
299	55503.64	1555802.34	15.18
300	55539.31	1555837.39	15.27
301	55573.66	1555873.85	16.00
302	55608.89	1555908.31	15.82
303	55648.83	1555939.88	14.33
304	55687.83	1555975.40	12.82
305	55726.93	1556002.42	11.17
306	55763.91	1556036.46	10.71
307	55798.17	1556073.02	11.49
308	55833.11	1556108.85	11.93
309	55871.57	1556141.32	10.77
310	55909.04	1556181.80	11.72
311	55941.73	1556212.31	11.42
312	55977.89	1556246.84	11.26
313	56013.85	1556281.59	11.23
314	56050.64	1556315.46	10.78

LEGEND

- EXISTING TOPOGRAPHY
- TOP OF SUBGRADE (FLOOR) OR FOUNDATION LAYER (SIDESLOPES)
- PROPERTY LINE
- EXISTING LIMIT OF WASTE
- PROPOSED LIMIT OF WASTE
- LIMIT OF SUB-CELL AREA
- GRADE BREAK
- +95 GRADE CONTROL POINT

NOTES:

1. TOPOGRAPHIC MAP PREPARED BY WALKER AND ASSOCIATES, SEATTLE, WASHINGTON, DATE OF FLIGHT: MAY 19, 2006 AND PORTIONS ARE ANTICIPATED TO BE UPDATED BASED ON GROUND SURVEY.
2. HORIZONTAL DATUM IS BASED ON NAD83 (1986), HAWAII ZONE 4, VERTICAL DATUM BASED ON LOCAL TOAL.
3. GRADES SHOWN REPRESENT TOP OF PREPARED SUBBASE FOR BASE LINER CONSTRUCTION.
4. THE CONTRACTOR SHALL PROVIDE A SURVEY STAKEOUT OF THE PERIMETER BERM AND PHASE I/CELL 1 LINER TIE-IN PRIOR TO BERM AND CELL 1 CONSTRUCTION.

SCALE 0' 20' 40' 80'

NO	REVISIONS	DATE

Shelbyville, Wisconsin
DSN SRB
DES TDH/MW
CHK K.B.
APP K.B.

PREPARED BY

AECOM

ENGINEERING REPORT
PHASE II LATERAL EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

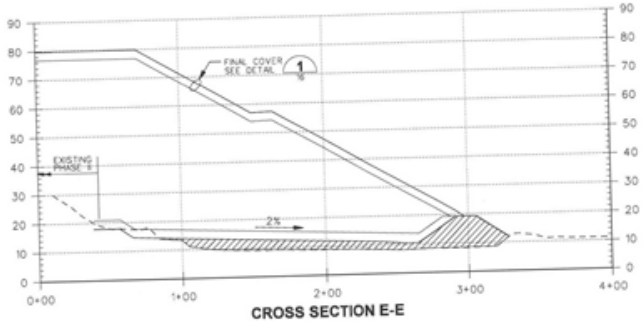
CELL 1 SUBBASE GRADES

DATE JANUARY 2009
PROJECT NO 95561
FILENAME 04Subbase.dgn
SHEET NO
DRAWING NO 4

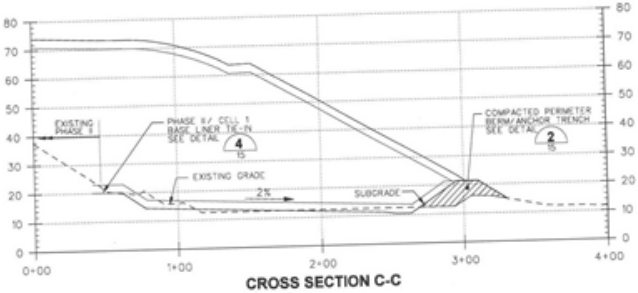
SCALE HORIZ. 0' 40' 80'
VERT. 0' 20' 40'

NOTES:

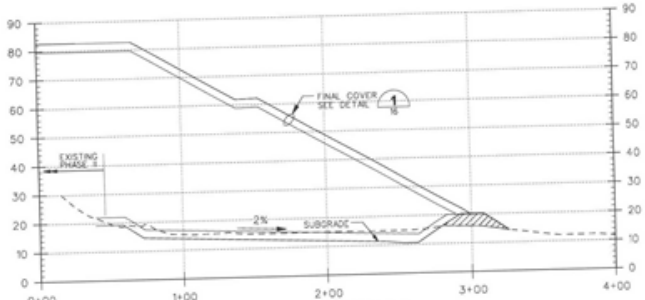
1. EXISTING GRADE IS BASED ON TOPOGRAPHIC MAP PREPARED BY WALKER AND ASSOCIATES, SEATTLE, WASHINGTON. DATE OF FLIGHT: MAY 19, 2006 AND PORTIONS ARE ANTICIPATED TO BE UPDATED BASED ON GROUND SURVEY.
2. HORIZONTAL DATUM IS BASED ON NAD83 (1986), HAWAII ZONE 4, VERTICAL DATUM BASED ON LOCAL TIDAL.



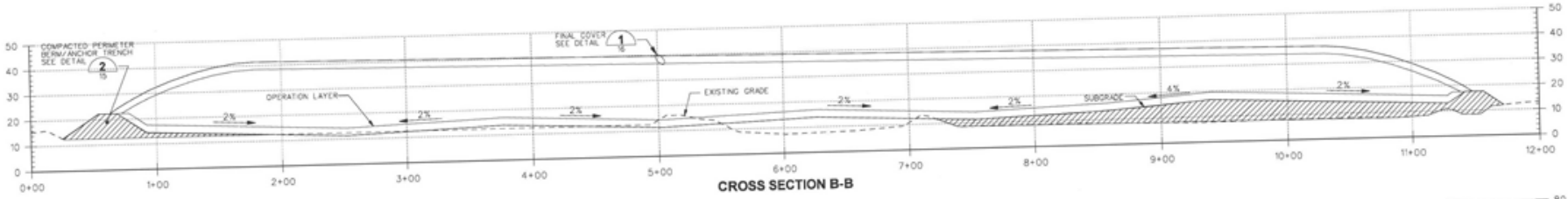
CROSS SECTION E-E



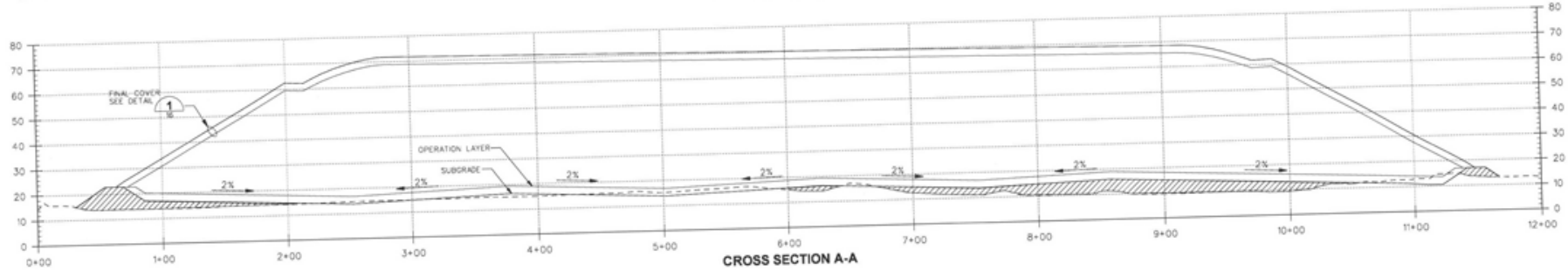
CROSS SECTION C-C



CROSS SECTION D-D



CROSS SECTION B-B

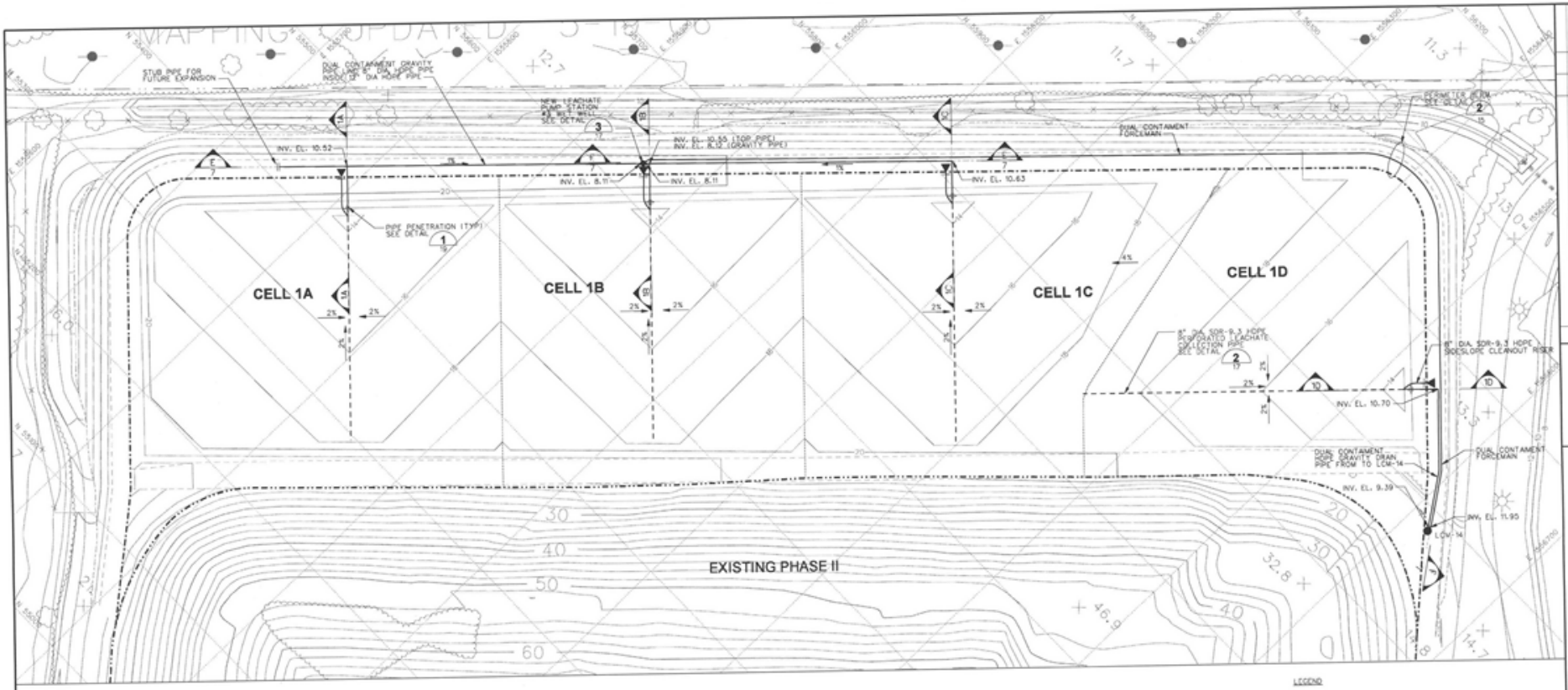


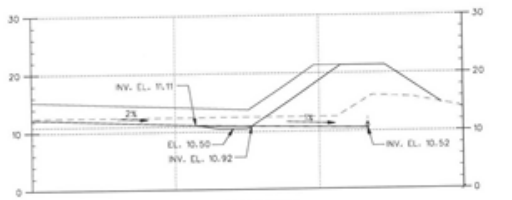
CROSS SECTION A-A

PREPARED BY	AECOM
ENGINEERING REPORT PHASE II LATERAL EXPANSION KEKAHA SANITARY LANDFILL KAUAI, HAWAII	CELL 1 CROSS SECTIONS
DATE	JANUARY 2009
PROJECT NO	95561
FILENAME	05Cell1_xsects.dgn
SHEET NO	
DRAWING NO	5

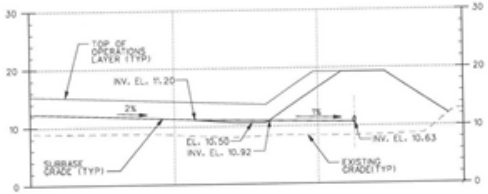
NO	REVISIONS	DRN	CHK	DATE

Shakopee, Minnesota
DRN DSB
DES TDH/MW
CHK KJB
APP KJB

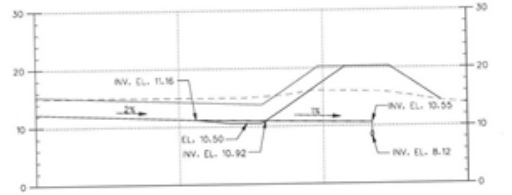




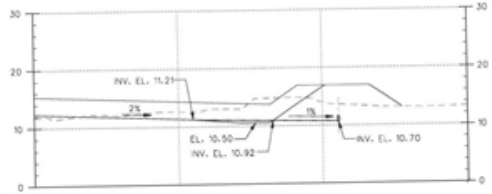
PROFILE 1A



PROFILE 1C



PROFILE 1B



PROFILE 1D

SCALE HORIZ. 0' 20' 40'
VERT. 0' 10' 20'

LEGEND

- EXISTING TOPOGRAPHY
- PROPERTY LINE
- EXISTING LIMIT OF WASTE
- PROPOSED LIMIT OF WASTE
- LIMIT OF SUB-CELL AREA
- GRADE BREAK
- LEACHATE COLLECTION PIPE
- CLEANOUT RISER

NOTES:

1. TOPOGRAPHIC MAP PREPARED BY WALKER AND ASSOCIATES, SEATTLE, WASHINGTON, DATED OCTOBER/MAY 08 2008 AND PORTIONS ARE ANTICIPATED TO BE UPDATED BASED ON GROUND SURVEY.
2. HORIZONTAL DATUM IS BASED ON NAD83 (1986), HAWAII ZONE 4. VERTICAL DATUM BASED ON LOCAL TIDAL.
3. GRADES SHOWN REPRESENT TOP OF OPERATION LAYER.
4. GRANULAR DRAINAGE LAYER AND OPERATION LAYER GRADE TO BE FIELD DOCUMENTED BASED UPON ASBUILT ELEVATIONS.

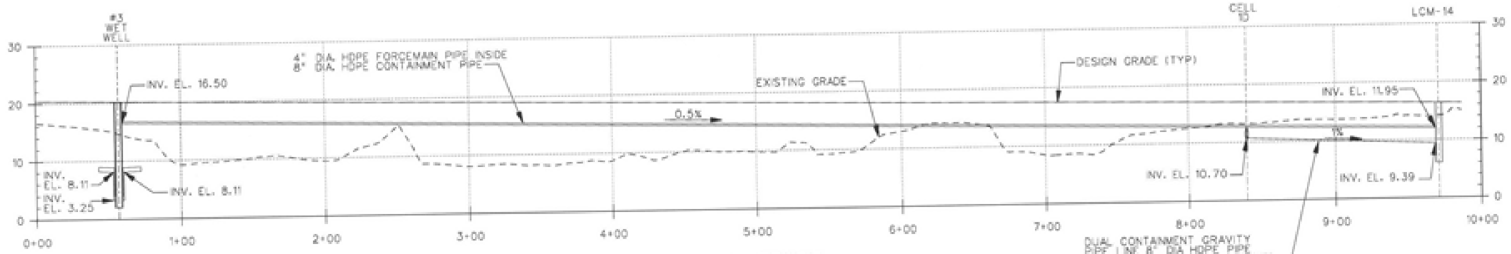
SCALE 0' 20' 40' 80'

AECOM

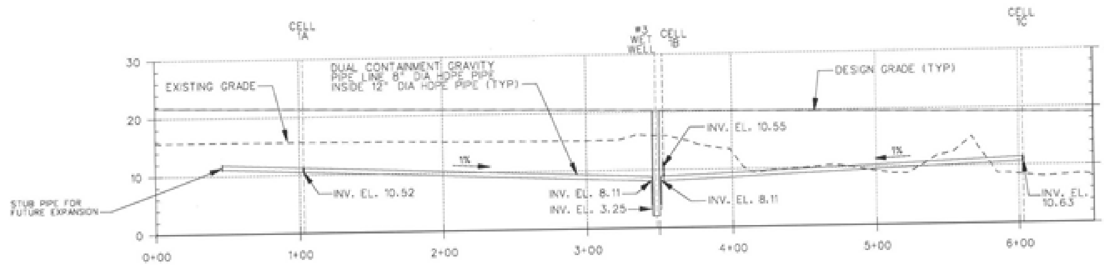
ENGINEERING REPORT
PHASE II LATERAL EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

CELL 1 LEACHATE MANAGEMENT SYSTEM

DATE JANUARY 2009
PROJECT NO 95561
FILENAME DEL-exch.dgn
SHEET NO
DRAWING NO 6


#3 WET WELL
4" DIA. HDPE FORCEMAIN PIPE INSIDE
8" DIA. HDPE CONTAINMENT PIPE
INV. EL. 16.50
EXISTING GRADE
DESIGN GRADE (TYP)
CELL 1D
LCM-14
INV. EL. 11.95
0.5%
1%
INV. EL. 8.11
INV. EL. 3.25
INV. EL. 8.11
INV. EL. 10.70
INV. EL. 9.39
DUAL CONTAINMENT GRAVITY PIPE LINE 8" DIA HDPE PIPE INSIDE 12" DIA HDPE PIPE (TYP)
0+00
1+00
2+00
3+00
4+00
5+00
6+00
7+00
8+00
9+00
10+00

PROFILE F


CELL 1A
#3 WET WELL
CELL 1B
CELL 1C
EXISTING GRADE
DUAL CONTAINMENT GRAVITY PIPE LINE 8" DIA HDPE PIPE INSIDE 12" DIA HDPE PIPE (TYP)
DESIGN GRADE (TYP)
INV. EL. 10.55
1%
STUB PIPE FOR FUTURE EXPANSION
INV. EL. 10.52
INV. EL. 8.11
INV. EL. 3.25
INV. EL. 8.11
INV. EL. 10.63
0+00
1+00
2+00
3+00
4+00
5+00
6+00

PROFILE E

SCALE HORIZ. 0' 40' 80'
VERT. 0' 10' 20'

NOTES:

1. EXISTING GRADE IS BASED ON TOPOGRAPHIC MAP PREPARED BY WALKER AND ASSOCIATES, SEATTLE, WASHINGTON, DATE OF FLIGHT: MAY 19, 2006 AND PORTIONS ARE ANTICIPATED TO BE UPDATED BASED ON GROUND SURVEY.
2. HORIZONTAL DATUM IS BASED ON NAD83 (1986), HAWAII ZONE 4. VERTICAL DATUM BASED ON LOCAL TIDAL.

REVISIONS

NO | DRN | CHK | DATE

Sheboygan, Wisconsin

DRN DRB
DES TCR/NAW
CHK KJB
APP KJB

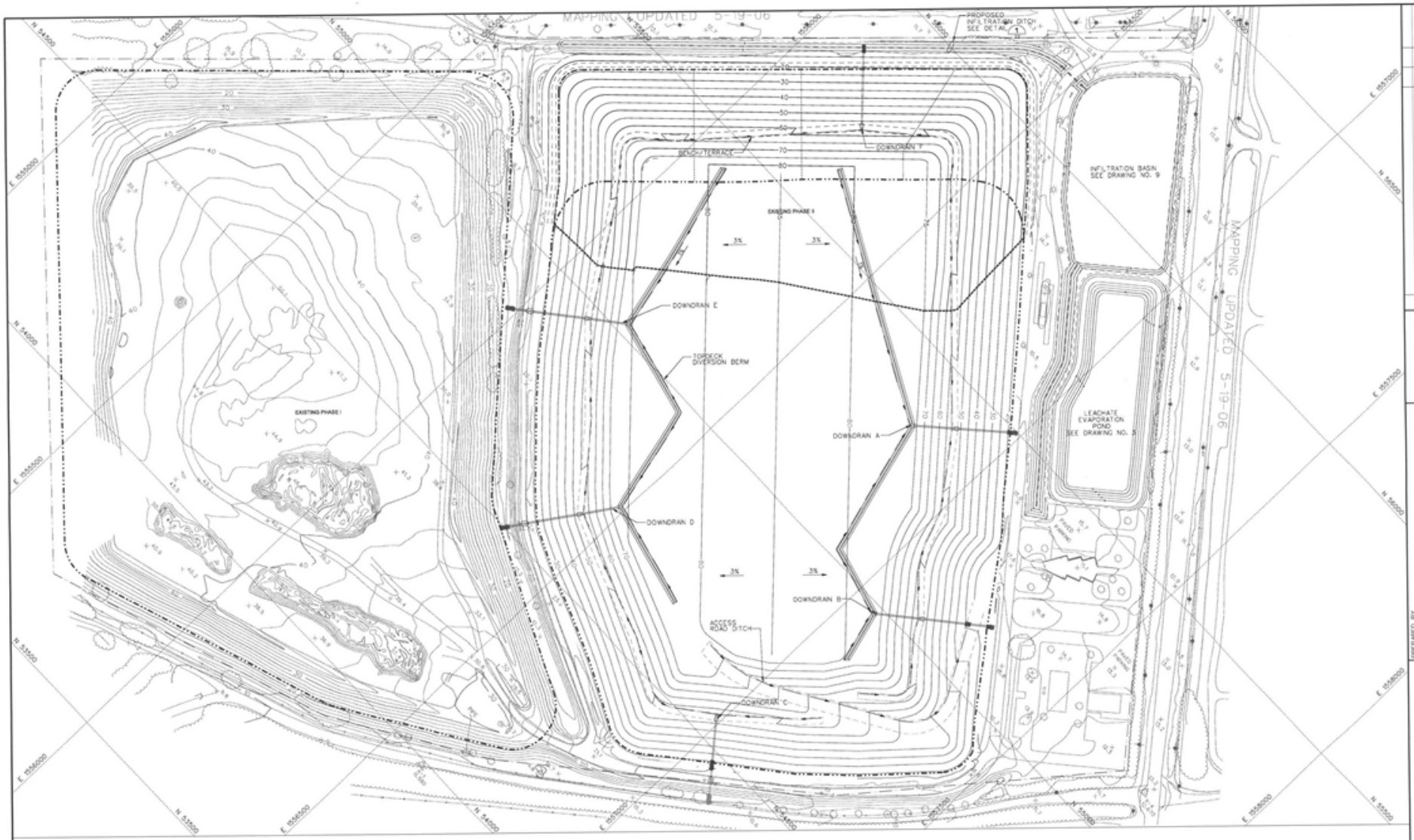
AECOM

PREPARED BY

ENGINEERING REPORT
PHASE II LATERAL EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

CELL 1 LEACHATE MANAGEMENT SYSTEM PIPING PROFILES

DATE JANUARY 2009
PROJECT NO 95561
FILENAME 07Profile.dgn
SHEET NO
DRAWING NO 7



LEGEND

- EXISTING TOPOGRAPHY
- PROPERTY LINE
- PROPOSED LIMIT OF WASTE
- CELL DEVELOPMENT LIMIT
- FINAL COVER OVERLAY LIMIT
- ACCESS ROAD

NOTES:

1. TOPOGRAPHIC MAP PREPARED BY WALKER AND ASSOCIATES, SEATTLE, WASHINGTON. DATE OF FLIGHT: MAY 19, 2006 AND PORTIONS ARE ANTICIPATED TO BE UPDATED BASED ON GROUND SURVEY.
2. GRADES SHOWN DEPICT TOP OF FINAL COVER SYSTEM. MAXIMUM FINAL COVER ELEVATION IS 85 FEET.
3. REFER TO DRAWINGS 16 AND 21 FOR SURFACE WATER CONTROL FEATURES AND FINAL COVER DETAIL.

SCALE 0' 50' 100' 200'

NO	DATE	BY	CHK	DES

Shakopee, Wisconsin

DRN	DRB
DES	TDW/MHW
CHK	KJB
APP	KJB

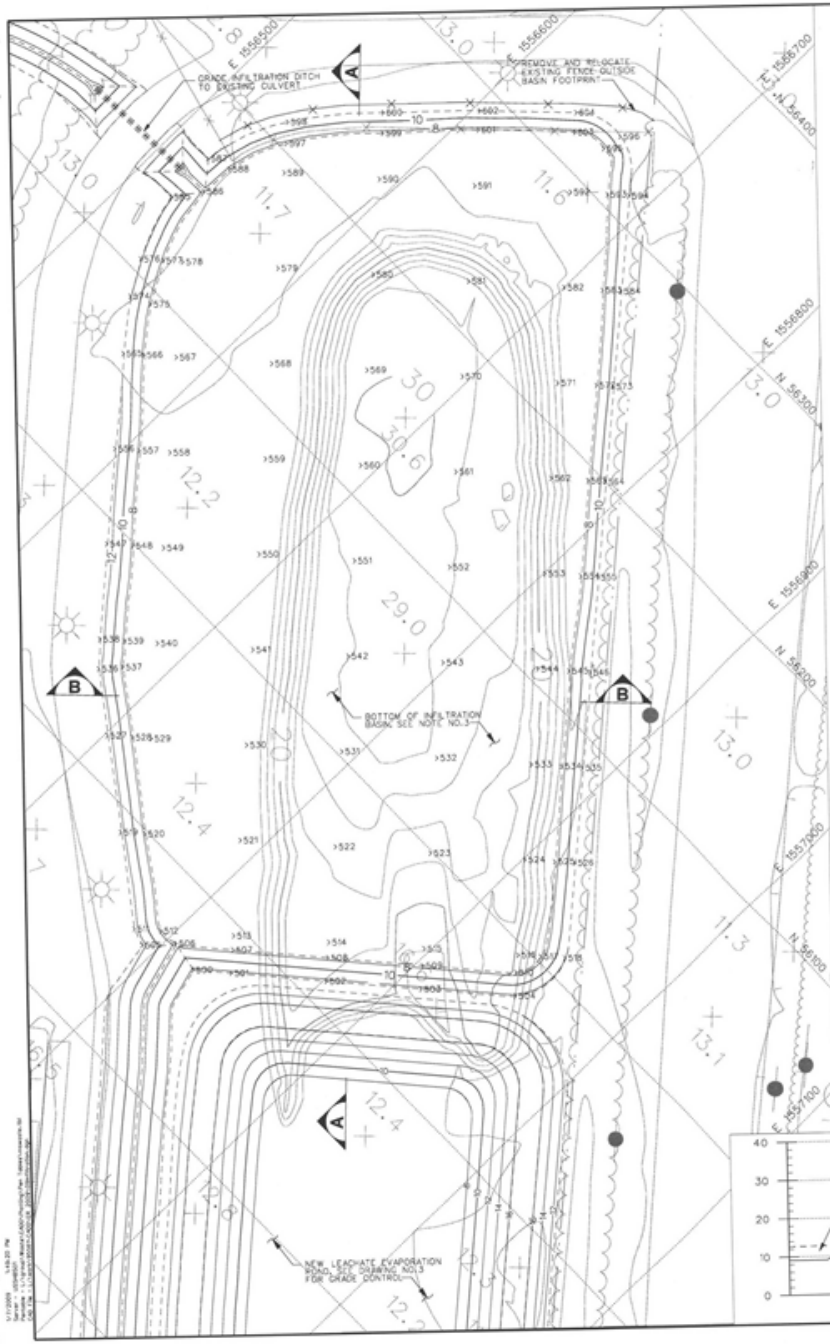
PREPARED BY

AECOM

ENGINEERING REPORT
PHASE II LATERAL EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

FINAL COVER GRADES

DATE	JANUARY 2009
PROJECT NO	95561
FILENAME	08f Ind Grades.dgn
SHEET NO	
DRAWING NO	8



Infiltration Basin Control Points

Point	Northing	Easting	Elevation
500	55867.24	1556821.23	12.40
501	55880.41	1556836.36	12.40
502	55913.26	1556874.06	12.42
503	55948.12	1556911.76	12.43
504	55979.37	1556949.11	12.38
505	55857.13	1556793.25	12.49
506	55870.52	1556808.03	7.50
507	55889.53	1556828.15	7.50
508	55922.40	1556865.83	7.50
509	55955.28	1556903.51	7.50
510	55988.16	1556940.46	7.50
511	55860.04	1556784.34	12.64
512	55869.52	1556794.87	7.50
513	55895.03	1556823.20	7.50
514	55928.49	1556860.35	7.50
515	55962.09	1556897.68	7.50
516	55995.40	1556934.87	7.50
517	56003.07	1556943.18	7.50
518	56011.27	1556952.30	12.06
519	55890.13	1556743.03	12.52
520	55898.75	1556752.61	7.50
521	55932.19	1556789.74	7.50
522	55965.64	1556826.90	7.50
523	55999.10	1556864.06	7.50
524	56032.56	1556901.21	7.50
525	56042.69	1556912.47	7.50
526	56049.61	1556920.15	11.63
527	56920.21	1556701.72	12.77
528	55929.21	1556711.71	7.50
529	55935.89	1556719.13	7.50
530	55969.34	1556756.28	7.50
531	56002.80	1556793.44	7.50
532	56036.26	1556830.60	7.50
533	56069.71	1556867.76	7.50
534	56079.96	1556879.14	7.50
535	56087.31	1556887.30	11.89
536	55941.41	1556673.60	12.57
537	55951.10	1556681.78	7.50
538	55952.51	1556682.87	12.73
539	55961.27	1556672.59	7.50
540	55973.04	1556685.67	7.50
541	56006.50	1556722.83	7.50
542	56039.96	1556759.99	7.50
543	56073.41	1556797.14	7.50
544	56106.87	1556834.30	7.50
545	56117.44	1556846.04	7.50
546	56125.01	1556854.44	12.02
547	55989.95	1556629.72	13.02
548	55999.20	1556640.00	7.50
549	56010.20	1556652.21	7.50
550	56043.66	1556689.37	7.50
551	56077.12	1556726.53	7.50
552	56110.57	1556763.69	7.50
553	56144.03	1556800.84	7.50
554	56156.48	1556814.67	7.50
555	56182.71	1556821.59	11.22
556	56027.73	1556596.96	12.70
557	56036.44	1556606.63	7.50
558	56047.36	1556618.76	7.50
559	56080.82	1556655.92	7.50
560	56114.27	1556693.07	7.50
561	56147.73	1556730.23	7.50
562	56181.19	1556767.39	7.50
563	56194.08	1556781.71	7.50
564	56200.40	1556788.73	11.28
565	56065.60	1556564.29	11.89
566	56072.94	1556572.45	7.50
567	56084.62	1556585.30	7.50
568	56117.97	1556622.46	7.50
569	56151.43	1556659.62	7.50
570	56184.89	1556696.77	7.50
571	56218.34	1556733.93	7.50
572	56232.06	1556749.17	7.50
573	56238.10	1556755.88	11.11
574	56089.24	1556545.38	12.03
575	56094.01	1556555.84	7.50
576	56106.79	1556535.31	12.10
577	56114.74	1556544.14	7.50
578	56121.87	1556551.84	7.50
579	56155.13	1556589.00	7.50
580	56188.59	1556626.16	7.50
581	56222.04	1556663.32	7.50
582	56255.50	1556700.47	7.50
583	56269.25	1556715.74	7.50
584	56275.80	1556723.02	11.42
585	56140.78	1556525.16	12.18
586	56155.17	1556533.13	7.50
587	56168.54	1556522.19	12.08
588	56172.86	1556533.96	7.50
589	56182.29	1556555.55	7.50
590	56225.74	1556592.70	7.50
591	56259.20	1556629.86	7.50
592	56292.66	1556667.02	7.50
593	56305.97	1556681.81	7.50
594	56313.50	1556690.18	12.00
595	56321.23	1556663.15	7.50
596	56331.92	1556664.76	11.82
597	56203.73	1556545.24	7.50
598	56212.10	1556537.71	11.82
599	56243.68	1556576.55	7.50
600	56251.39	1556569.07	11.79
601	56280.93	1556610.29	7.50
602	56288.36	1556603.61	11.49
603	56315.95	1556646.04	7.50
604	56323.66	1556639.10	11.65

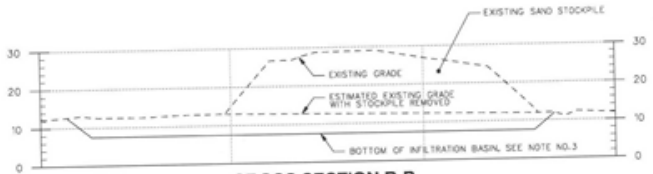
LEGEND

- EXISTING TOPOGRAPHY
- PROPERTY LINE
- >520 CONTROL POINT

NOTES:

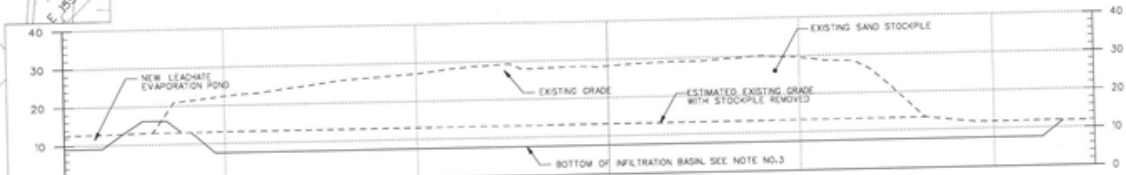
1. TOPOGRAPHIC MAP PREPARED BY WALKER AND ASSOCIATES, SEATTLE, WASHINGTON, DATE OF FLIGHT: MAY 19, 2008 AND PORTIONS ARE ANTICIPATED TO BE UPDATED BASED ON GROUND SURVEY.
2. HORIZONTAL DATUM IS BASED ON NAD83 (1986), HAWAII ZONE 4. VERTICAL DATUM BASED ON LOCAL TIDAL.
3. INFILTRATION BASIN IS A UNLINED NATURAL DRAIN SYSTEM UTILIZING THE INSITU SAND OF THE SITE TO DISCHARGE SURFACE WATER.

SCALE: 0 15' 30' 60'



CROSS SECTION B-B

HORIZ. SCALE: 0 15' 30' 60'



CROSS SECTION A-A

Shelbyglynn, Wisconsin
DWN DRB
DES TCR/MKB
CHK KJB
APP KJB
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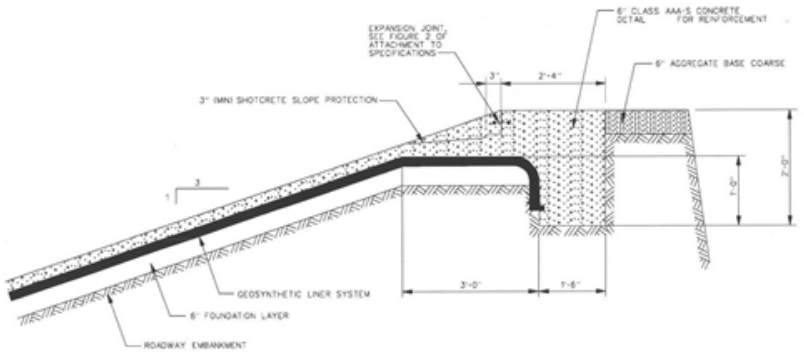
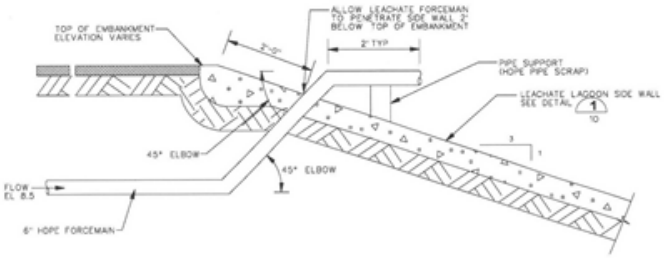
ENGINEERING REPORT
PHASE II LATERAL EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

INFILTRATION BASIN GRADES AND CROSS SECTIONS

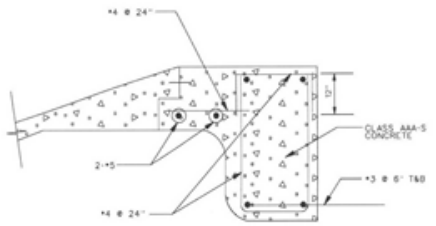
DATE JANUARY 2009
PROJECT NO 95581
FILENAME Infiltration.dgn
SHEET NO
DRAWING NO 9



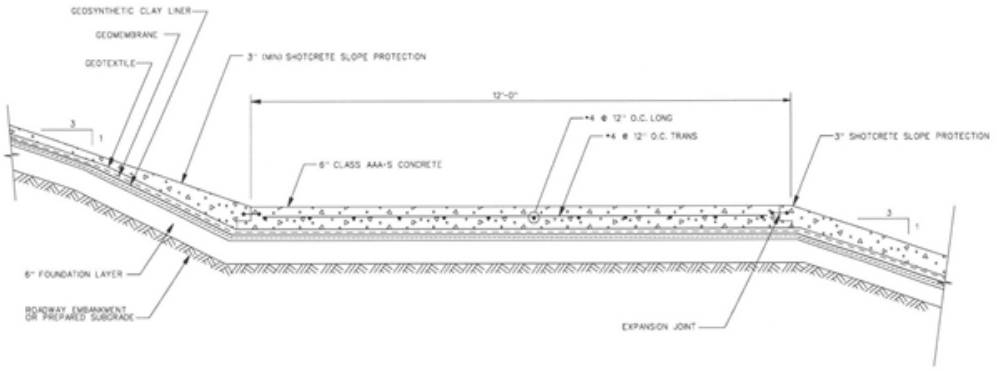
EXISTING EVAPORATION POND PERIMETER ROAD AND ANCHOR TRENCH 1
NTS



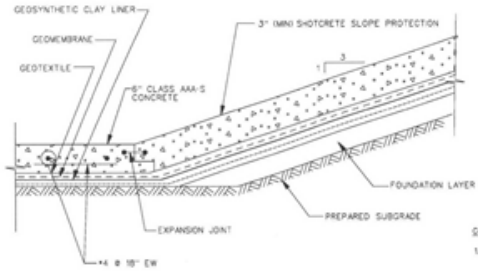
EXISTING FORCEMAIN OUTLET 3
NTS



EXISTING ANCHOR TRENCH DETAIL 4
NTS



EXISTING EVAPORATION POND ACCESS RAMP 2
NTS



EXISTING EVAPORATION POND BOTTOM LINER 5
NTS

GENERAL NOTES:

1. EXISTING DETAILS ARE BASED UPON DRAWINGS TITLED, "KEKAHA SANITARY LANDFILL, PHASE 2, KEKAHA, HAWAII", PREPARED BY HARDING LAWSON ASSOCIATES, DATED MARCH 1993.
2. CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL COMPONENTS OF EXISTING LEACHATE EVAPORATION POND BASE LINER IN EXISTING PHASE II AS DESIGNATED BY OWNER/SANFIL. THE EXISTING LEACHATE EVAPORATION POND AERATORS SHALL BE RELOCATED. THE PERIMETER BERM SHALL BE REMOVED AND POND SHALL BE GRADED TO CELL GRADES AS DETERMINED BY ONSITE CQA PERSONNEL.
3. DECOMMISSIONING OF THE EXISTING LEACHATE EVAPORATION POND SHALL NOT OCCUR UNTIL AFTER THE NEW LEACHATE EVAPORATION POND IS CONSTRUCTED AND PLACED IN OPERATION.

NO	REVISIONS	CHK	DATE

Sheboygan, Wisconsin
DRN DRB
DES TDS/HKW
CHK KJB
APP KJB
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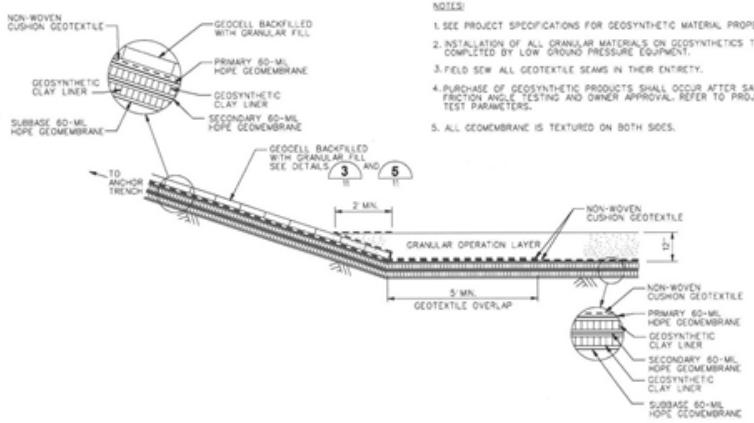
ENGINEERING REPORT
PHASE II LATERAL EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

EXISTING LEACHATE EVAPORATION POND DETAILS

DATE JANUARY 2009
PROJECT NO 95561
FILENAME 10details.dgn
SHEET NO
DRAWING NO 10

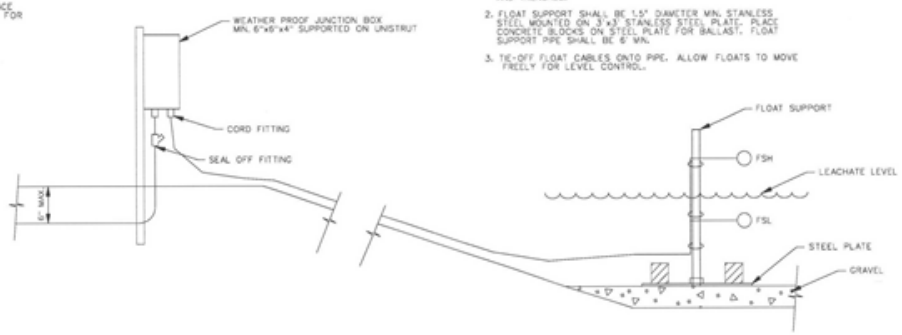


NOTES:

1. SEE PROJECT SPECIFICATIONS FOR GEOSYNTHETIC MATERIAL PROPERTIES.
2. INSTALLATION OF ALL GRANULAR MATERIALS ON GEOSYNTHETICS TO BE COMPLETED BY LOW GROUND PRESSURE EQUIPMENT.
3. FIELD SEW ALL GEOTEXTILE SEAMS IN THEIR ENTIRETY.
4. PURCHASE OF GEOSYNTHETIC PRODUCTS SHALL OCCUR AFTER SATISFACTORY INTERFACE FRICTION ANGLE TESTING AND OWNER APPROVAL. REFER TO PROJECT SPECIFICATIONS FOR TEST PARAMETERS.
5. ALL GEOMEMBRANE IS TEXTURED ON BOTH SIDES.

LEACHATE EVAPORATION POND BASE LINER DETAIL 1

NTS



NOTES:

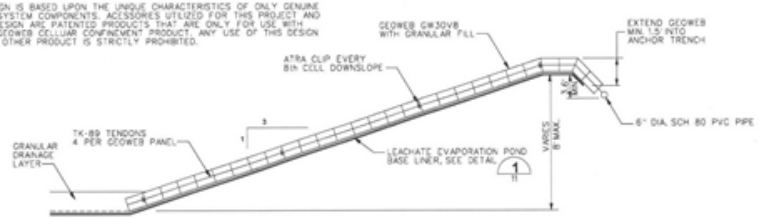
1. LOCATE JUNCTION BOX SO IT DOES NOT INTERFERE WITH LEACHATE EVAPORATION POND GEOSYNTHETIC MATERIALS AND TRENCHES.
2. FLOAT SUPPORT SHALL BE 1.5" DIAMETER MIN. STAINLESS STEEL MOUNTED ON 3'x3' STAINLESS STEEL PLATE. PLACE CONCRETE BLOCKS ON STEEL PLATE FOR BALLAST. FLOAT SUPPORT PIPE SHALL BE 6' MIN.
3. TIE-OFF FLOAT CABLES ONTO PIPE. ALLOW FLOATS TO MOVE FREELY FOR LEVEL CONTROL.

FLOAT LEVEL SWITCH DETAIL 2

NTS

NOTES:

1. GEOCELL SYSTEM DESIGN AND DETAILS PROVIDED BY PRESTO.
2. THIS DESIGN IS BASED UPON THE UNIQUE CHARACTERISTICS OF ONLY GENUINE GEOWEB SYSTEM COMPONENTS. ACCESSORIES UTILIZED FOR THIS PROJECT AND IN THIS DESIGN ARE PATENTED PRODUCTS THAT ARE ONLY FOR USE WITH GENUINE GEOWEB CELLULAR CONFINEMENT PRODUCT. ANY USE OF THIS DESIGN FOR ANY OTHER PRODUCT IS STRICTLY PROHIBITED.

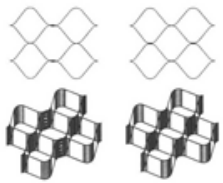


GEOWEB ANCHORAGE AND TERMINATION DETAIL

TENDON DETAIL

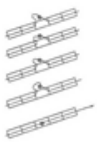
NOTES FOR STANDARD CONNECTIONS BETWEEN GEOWEB® SECTIONS:

1. ADJACENT GEOWEB SECTIONS ARE STAPLED TOGETHER USING MANUFACTURER APPROVED STAPLERS AND STAPLES
2. THE TOP EDGES OF ADJACENT CELL WALLS SHOULD BE HELD FLUSH WHEN STAPLING.
3. SIDE CONNECTIONS BETWEEN EXPANDED GEOWEB SECTIONS SHOULD BE INTERLEAFED AS SHOWN IN FIGURE A. WELDED EDGE SEAMS SHOULD BE ALIGNED WHEN STAPLING.
4. END CONNECTIONS BETWEEN GEOWEB SECTIONS SHOULD BE BUTTED AS SHOWN IN FIGURE B. THE LONGITUDINAL CENTER-LINES OF ABUTTING EXTERNAL CELLS SHOULD BE ALIGNED AND STAPLED AT THE CELL WALL CONTACT POINT.

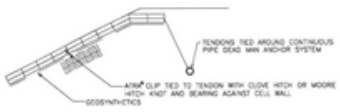


SIDE AND END CONNECTION DETAIL

STEP 1 – PLACE THE TENDON UNDER ONE ARM OF THE ATRA® CLIP.
STEP 2 – DIAGONALLY CROSS THE TENDON OVER THE TOP OF THE ATRA® CLIP.
STEP 3 – PLACE THE TENDON UNDER THE OTHER ARM AND PULL TAUGHT TO REMOVE ANY SLACK.
STEP 4 – DIAGONALLY CROSS THE TENDON BACK OVER THE TOP OF THE ATRA® CLIP AND PLACE THE TENDON UNDER THE FIRST ARM.
STEP 5 – PULL THE TENDON TAUGHT TO REMOVE ANY SLACK. REPEAT THIS PROCESS IF THE TENDON SLIPS AROUND THE ATRA® CLIP.
STEP 6 – PULL THE TENDON TAUGHT AT THE LOCATION OF THE NEXT ATRA® CLIP.



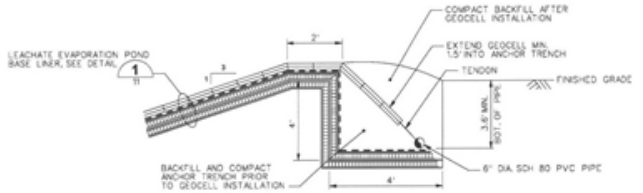
ATRA CLIP INSTALLATION DETAIL



TYPICAL TENDON CREST ANCHOR SYSTEM DETAIL

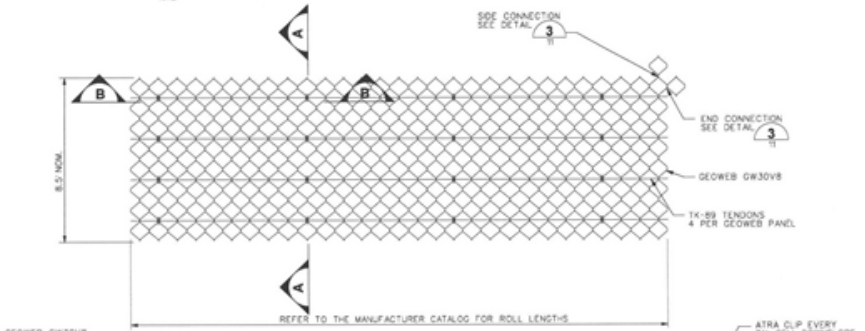
GEOCELL INSTALLATION AND ANCHORING DETAIL 3

NTS



LEACHATE EVAPORATION POND BASE LINER ANCHOR TRENCH DETAIL 4

NTS



NOTES:

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2. THIS DESIGN IS BASED UPON THE UNIQUE CHARACTERISTICS OF ONLY GENUINE GEOWEB SYSTEM COMPONENTS. ACCESSORIES UTILIZED FOR THIS PROJECT AND IN THIS DESIGN ARE PATENTED PRODUCTS THAT ARE ONLY FOR USE WITH GENUINE GEOWEB CELLULAR CONFINEMENT PRODUCT. ANY USE OF THIS DESIGN FOR ANY OTHER PRODUCT IS STRICTLY PROHIBITED.

GEOCELL PANEL CONNECTIONS DETAIL 5

NTS

NO	REVISIONS	DRN	CHK	DATE
1	REMOVED WOVEN GEOTEXTILE IN DETAIL 1	DRB	KJB	2/2/2009

Shelbyville, Wisconsin

DRN	DRB	
DES	TCB/NHB	
CHK	KJB	
APP	KJB	

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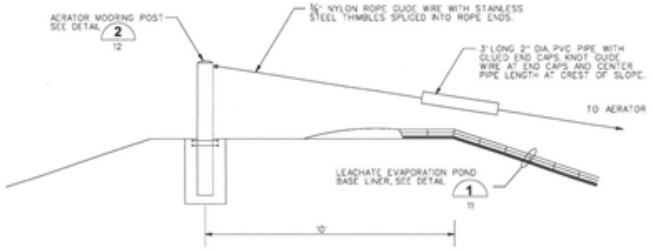
ENGINEERING REPORT
PHASE II EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

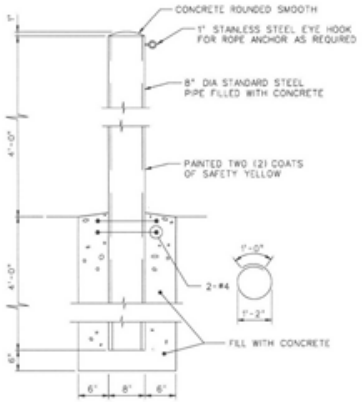
LEACHATE EVAPORATION POND DETAILS

DATE: JANUARY 2009
PROJECT NO: 95561
FILENAME: 11Detail5.dgn
SHEET NO:
DRAWING NO: 11



AERATOR MOORING POST LOCATION AND GUIDE WIRE DETAIL 1

NTS



AERATOR MOORING POST DETAIL 2

NTS

Sheboygan, Wisconsin

DRN	DRB
DES	TEK/NKW
CHK	K.B.
APP	K.B.

NO	REVISIONS	DRN	CHK	DATE

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ENGINEERING REPORT
PHASE II LATERAL EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

LEACHATE EVAPORATION POND DETAILS

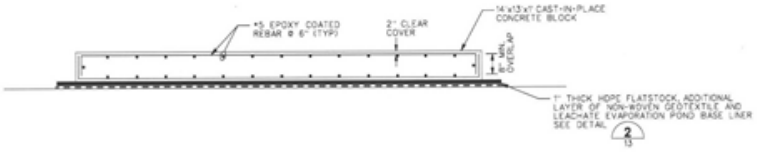
DATE JANUARY 2009

PROJECT NO 95561

FILENAME 12details.dgn

SHEET NO

DRAWING NO 12



LEACHATE AERATOR SUPPORT PAD REINFORCEMENT DETAIL 1

NTS

NOTES:

1. CAST-IN-PLACE CONCRETE

   A. PORTLAND CEMENT: ASTM C150, CLASS I OR II.

   B. AGGREGATES: ASTM C33, MODIFIED AS FOLLOWS:
      a. FINE SAND: NATURAL SAND.
      b. COARSE AGGREGATE: CRUSHED GRAVEL, CRUSHED STONE OR GRAVEL.

   C. WATER: POTABLE.

   D. CONCRETE MIX:
      a. CONCRETE:
         i) MINIMUM 6 BAGS OF CEMENT PER CUBIC YARD OF CONCRETE.
         ii) MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4000 PSI.
         iii) SLUMP: 4 +/- 1 IN.
         iv) WATER/CEMENT RATIO: 0.42 MAXIMUM.
         v) SIZE 467 COARSE AGGREGATE
         vi) TRICALCIUM ALUMINATE (C_3A) CONTENT SHALL NOT EXCEED 5%. IF THESE TYPES ARE NOT AVAILABLE, TYPE I WITH C_3A CONTENT LESS THAN 8% OR TYPE II SHALL BE USED IN COMBINATION WITH FLY ASH (ASTM C618).

   E. MIXING AND DELIVERY:
      a. USE READY MIXED CONCRETE. DELIVER AND DISCHARGE WITHIN 1-1/2 HRS OF COMMENCING OF MIXING OR BEFORE 300 REVOLUTIONS OF DRUM OR BLADES, WHICHEVER COMES FIRST.
      b. DO NOT ADD WATER ON SITE.
      c. DELIVER CONCRETE TO SITE HAVING TEMPERATURE NOT LESS THAN 50 DEGREES F NOR GREATER THAN 90 DEGREES F.

   F. FINISHING CONCRETE:
      a. PROVIDE ITI STEEL TROWELING OF PAD SURFACE AFTER INITIAL FLOAT.
      b. PATCH HONEYCOMBING, STONE POCKETS, FORM TIES, SPALLS, AND OTHER IRREGULARITIES IN FORMED CONCRETE SURFACES BEFORE CURING.

   G. PROTECTION AND CURING:
      a. WET CURE FOR MINIMUM OF 7 DAYS AFTER PLACING IN ACCORDANCE WITH ACI 308.
      b. USE LIQUID CURING COMPOUND OR WET CURE.

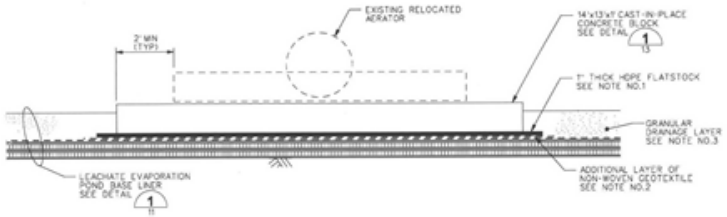
   H. PROVIDE COVER FOR REINFORCEMENT AS FOLLOWS: 2 INCHES.

2. REINFORCEMENT

   A. DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60, WITH EPOXY COATING IN ACCORDANCE WITH ASTM A775.
   B. DO NOT WELD OR FIELD BEND REINFORCING BARS.
   C. SUPPORT AND TIE REINFORCING STEEL AT INTERSECTIONS IN ACCORDANCE WITH CRSI "PLACING REINFORCING BARS" WITH MAXIMUM SPACING OF 4 FT.
   D. REINFORCEMENT SHALL BE CLEAN AND FREE FROM LOOSE MILL SCALE, DIRT, GREASE, OIL, FORM RELEASE AGENT, DRIED CONCRETE OR ANY MATERIAL REDUCING BOND WITH CONCRETE.

3. METALS

   A. STAINLESS STEEL BATTEN STRIP: ASTM TYPE 316
   B. CONCRETE ANCHORS: STAINLESS STEEL



NOTES:

1. EXTEND FLATSTOCK A MINIMUM OF 6" PAST CONCRETE BLOCK. FIELD SEAM FLATSTOCK AS NEEDED TO FORM CONTINUOUS SHEET. ROUND ALL EDGES AND CORNERS OF FLATSTOCK.
2. EXTEND ADDITIONAL LAYER OF NON-WOVEN GEOTEXTILE A MINIMUM 6" PAST FLATSTOCK EDGE. OVERLAP ADDITIONAL LAYER OF NON-WOVEN GEOTEXTILE FOR FIELD SEAM A MINIMUM OF 2' UNDER FLATSTOCK AS NEEDED.
3. INSTALL GRANULAR DRAINAGE LAYER TO EDGE OF FLATSTOCK PRIOR TO ANY FORM WORK, REBAR CONSTRUCTION, CONCRETE POURING, AND PAD MATERIAL MOBILIZATION. MAINTAIN GRANULAR DRAINAGE LAYER THICKNESS PER PROJECT SPECIFICATIONS FOR VEHICLE TRAFFIC. PLACE GRANULAR DRAINAGE LAYER TO PAD AFTER REMOVAL OF ALL FORMS AND FINAL GRADE.

LEACHATE AERATOR SUPPORT PAD DETAIL 2

NTS

NO	DATE	REVISIONS	DRN	CHK
1	2/2009	REVISED DETAILS 1 AND 2, DELETED DETAIL 3	DRB	KJB

Shelboygan, Wisconsin

DRN	DRB
DES	TDR/NKW
CHK	KJB
APP	KJB

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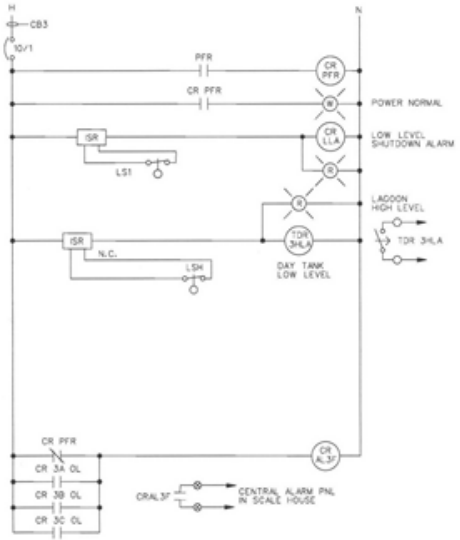
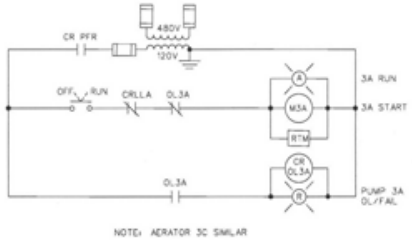
ENGINEERING REPORT
PHASE II LATERAL EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

LEACHATE EVAPORATION POND DETAILS

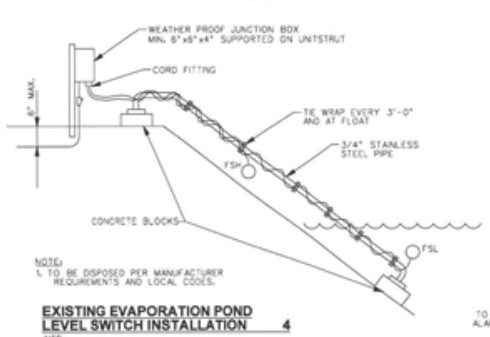
DATE	JANUARY 2009
PROJECT NO	95561
FILENAME	13Detail.dgn
SHEET NO	
DRAWING NO	13



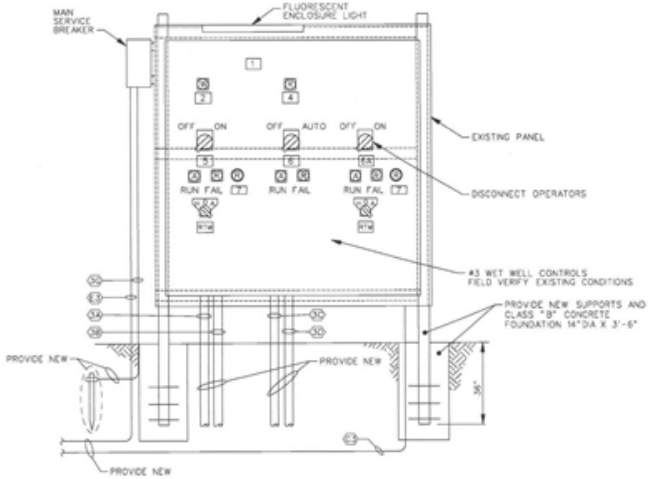
EXISTING AERATOR P.S. #3 CONTROL WIRING DIAGRAMS 1
NTS FOR REFERENCE



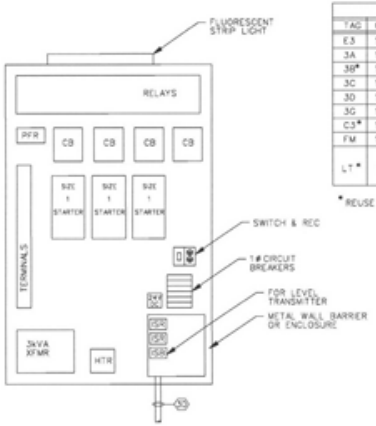
EXISTING AERATOR #3A CONTROL WIRING DIAGRAM 3
NTS FOR REFERENCE



EXISTING EVAPORATION POND LEVEL SWITCH INSTALLATION 4
NTS



MODIFICATIONS TO EXISTING AERATOR POWER CONTROL PANEL ELEVATION 5
NTS

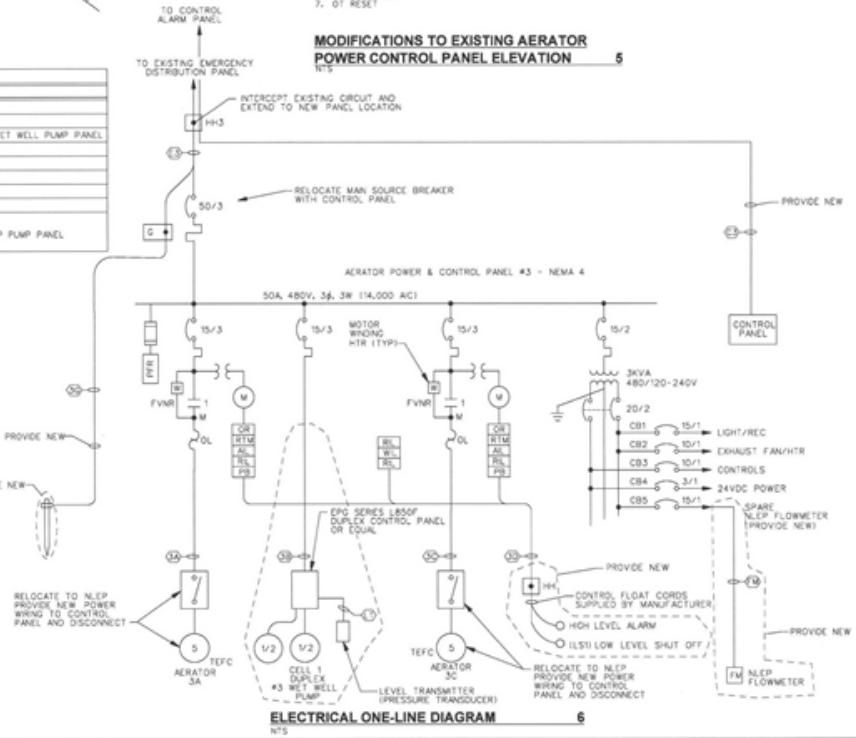


EXISTING AERATOR POWER & CONTROL PANEL INTERNAL ELEVATION 2
NTS

KEKAHA CONDUIT & WIRE SCHEDULE

TAG	CONDUIT	CABLE	FROM	TO
E3	1-1 1/2" PVC	3#2 & 1#6 G	EDP	CP No. 3
3A	1-1" C	3#12 & 1#12 G	CP No.3	A3A
3B*	1-1" C	3#8 & 1#10 G	CP No.3	CELL #1 DUPLEX #3 WET WELL PUMP PANEL
3C	1-1" C	3#12 & 1#14 G	CP No.3	A3C
3D	1-1" C	4#14 & 1#14 G	CP No.3	FLOATS JB
3G	1-1/2" PVC	1#6	CP No.3	GND
C3*	1-1/2" PVC	10#12 & 1 PULLCORD	AERATOR PNL 3	CAP VIA HH3
FM	1-1" C	2#12 & 1#12 G	FLOWMETER	CP NO.3
LT*	1-1" C	1-2/C #16, 6#14, #14G SHIELDED	LEVEL TRANSMITTER, PUMPS OFF, LEAD START, LAG START, FLOAT SWITCHES	CP NO.3 DUPLEX SUMP PUMP PANEL

*REUSE EXISTING CONDUITS WHERE AVAILABLE AND SUITABLE FOR USE.



ELECTRICAL ONE-LINE DIAGRAM 6
NTS

GENERAL NOTE:

1. EXISTING DETAILS ARE BASED UPON DRAWINGS TITLED, "KEKAHA SANITARY LANDFILL PHASE 2, KEKAHA, HAWAII", PREPARED BY HARDING LAWSON ASSOCIATES, DATED MARCH 1993.

NO	REVISIONS	DRN	CHK	DATE

Sheboygan, Wisconsin
DSN: DAB
DES: TCR/MW
CHK: KJB
APP: KJB
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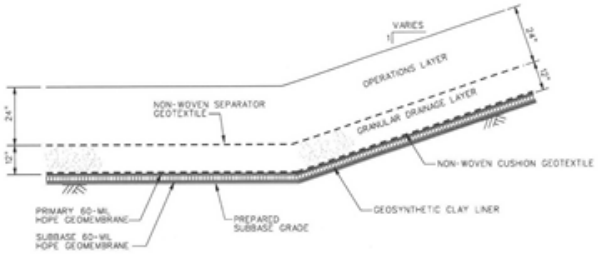
ENGINEERING REPORT
PHASE 2 EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

EXISTING AND NEW LEACHATE EVAPORATION POND ELECTRICAL DETAILS

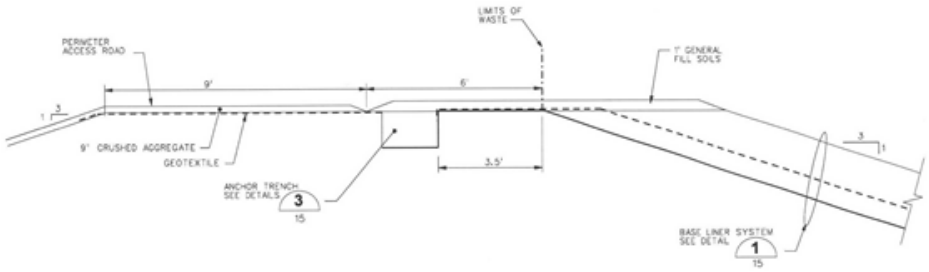
DATE JANUARY 2009
PROJECT NO 95581
FILENAME M0eccls.dgn
SHEET NO
DRAWING NO 14



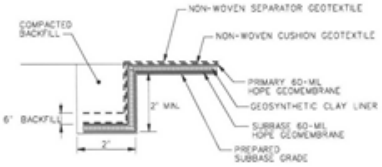
TYPICAL BASE LINER DETAIL - CELL 1 1
NTS

NOTES:

1. ALL GEOMEMBRANE IS TEXTURED ON BOTH SIDES.
2. WHEN DEPLOYING GCL OR GEOTEXTILES OVER TEXTURED GEOMEMBRANE OR WHEN DEPLOYING TEXTURED GEOMEMBRANE OVER GCL OR GEOTEXTILES, A RUBSHEET SHALL BE USED BETWEEN THE TWO MATERIALS AND REMOVED AFTER FINAL MATERIAL POSITIONING.



PERIMETER BERM/ACCESS ROAD (NO FINAL COVER INSTALLED) 2
NTS



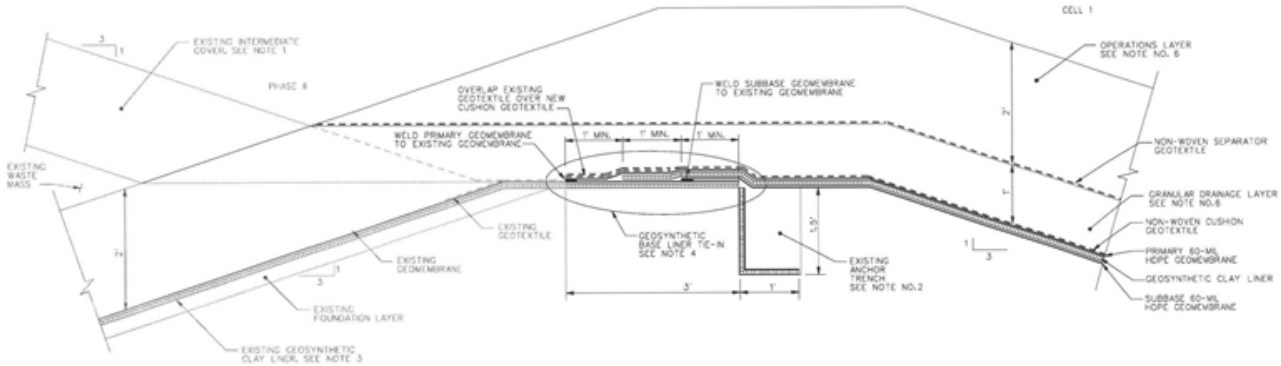
NOTES:

1. CONTRACTOR TO MAINTAIN ANCHOR TRENCH FREE OF WATER AND DEBRIS. DRAIN ANCHOR TRENCH AS NEEDED. REMOVE AND REPLACE ANY HYDRATED GCL.
2. ALL GEOMEMBRANE IS TEXTURED ON BOTH SIDES.

PERIMETER BERM ANCHOR TRENCH FOR TYPICAL BASE LINER 3
NTS

GENERAL NOTES:

1. PURCHASE OF GEOSYNTHETIC PRODUCTS SHALL OCCUR AFTER SATISFACTORY INTERFACE FRICTION ANGLE TESTING AND OWNER APPROVAL. REFER TO PROJECT SPECIFICATIONS FOR TEST PARAMETERS.
2. PLACEMENT OF GRANULAR DRAINAGE LAYER AND OPERATION LAYER TO BE COMPLETED BY LOW GROUND PRESSURE EQUIPMENT DEFINED IN PROJECT SPECIFICATIONS.
3. ALL GEOTEXTILE SEAMS TO BE FIELD SEWN IN THEIR ENTIRETY.



PHASE II / CELL I BASE LINER TIE-IN DETAIL 4
NTS

NOTES:

1. CONTRACTOR TO EXPOSE EXISTING ANCHOR TRENCH, GEOSYNTHETIC BASE LINER AND DRAINAGE LAYER OF PHASE II. COORDINATE WITH OWNER ACCESS TO TIE-IN AREA TO AVOID CONFLICT WITH SITE OPERATION. EXPOSURE ACTIVITIES WILL INCLUDE AT A MINIMUM REMOVAL OF EXISTING INTERMEDIATE COVER, EXISTING SOILS OVERLYING THE ANCHOR TRENCH AND BERM. CARE IS TO BE TAKEN DURING REMOVAL OF SOILS DIRECTLY IN CONTACT GEOSYNTHETICS. EXPOSURE ACTIVITIES TO BE CONSTANTLY MONITORED BY QUALITY ASSURANCE CONSULTANT AND DOCUMENTED. EXCESS DAMAGE AND RESULTING REPAIRS CAUSED FROM EXPOSING TIE-IN AREA WILL BE RESPONSIBILITY OF CONTRACTOR. CONTRACTOR TO MAINTAIN SURFACE WATER CONTROL FROM TIE-IN AREA.
2. CUT GEOSYNTHETICS ENTERING ANCHORING TRENCH AT ANCHOR TRENCH EDGE. PROTECT EXPOSED EDGE FROM DRYING AND MOISTURE. REMOVE ALL REMAINING PORTIONS OF GEOSYNTHETICS FROM ANCHOR TRENCH. BACKFILL ANCHOR TRENCH WITH STRUCTURAL FILL AND COMPACT PER PROJECT SPECIFICATIONS.
3. EXISTING GEOSYNTHETIC CLAY LINER (GCL) OF PHASE II IS COMPRISED OF A BENTONITE LAYER WITH A GEOMEMBRANE CARRIER. THE GEOMEMBRANE IS IN DIRECT CONTACT WITH THE SUBBASE. CARE TO BE TAKEN NOT TO PULL GCL FROM OVERLYING GEOMEMBRANE DURING TIE-IN CONSTRUCTION.
4. CONSTRUCT GEOSYNTHETIC BASE LINER TIE-IN IN THE FOLLOWING ORDER:
   - A. INSTALL NEW SUBBASE GEOMEMBRANE AND WELD TO EXISTING GEOMEMBRANE WITH A MINIMUM 1-FOOT OVERLAP.
   - B. INSTALL NEW GEOSYNTHETIC CLAY LINER (GCL) ON TOP OF SUBBASE GEOMEMBRANE WITH MINIMUM 2-FOOT OVERLAP ONTO EXISTING GEOMEMBRANE.
   - C. INSTALL NEW PRIMARY GEOMEMBRANE OVER NEW GCL AND WELD TO EXISTING GEOMEMBRANE MINIMUM 1-FOOT PAST NEW GCL OVERLAP.
   - D. INSTALL NEW NON-WOVEN CUSHION GEOTEXTILE OVER PRIMARY GEOMEMBRANE. OVERLAP EXISTING GEOTEXTILE ON NEW NON-WOVEN GEOTEXTILE A MINIMUM OF 2 FEET AND HEAT BURNISH FIELD OVERLAP SEAM. REPAIR THINNED OR TORN PORTIONS OF THE EXISTING GEOTEXTILE WITH NEW NON-WOVEN GEOTEXTILE AS NEEDED.
   - E. INSTALL GRANULAR DRAINAGE LAYER.
   - F. INSTALL NEW NON-WOVEN SEPARATOR GEOTEXTILE.
   - G. INSTALL OPERATIONS LAYER.
5. WHEN DEPLOYING GCL OR GEOTEXTILES OVER TEXTURED GEOMEMBRANE OR WHEN DEPLOYING TEXTURED GEOMEMBRANE OVER GCL OR GEOTEXTILES, A RUBSHEET SHALL BE USED BETWEEN THE TWO MATERIALS AND REMOVED AFTER FINAL MATERIAL POSITIONING.
6. INSTALL GRANULAR DRAINAGE LAYER AND OPERATIONS OVER TIE-IN AREA PRIOR TO PLACEMENT OF MATERIALS ON SIDESLOPES. PLACEMENT OF MATERIALS ON SIDESLOPES TO OCCUR FROM TOE OF SLOPE UP SIDESLOPE.
7. ALL GEOMEMBRANE IS TEXTURED ON BOTH SIDES.

NO	REVISIONS	DRN	CHK	DATE

Shelbyprpn, Wisconsin

DSN	DRB
DES	TCB/NCB
CHK	KJB
APP	KJB

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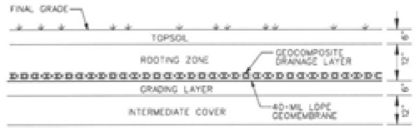
ENGINEERING REPORT
PHASE II EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

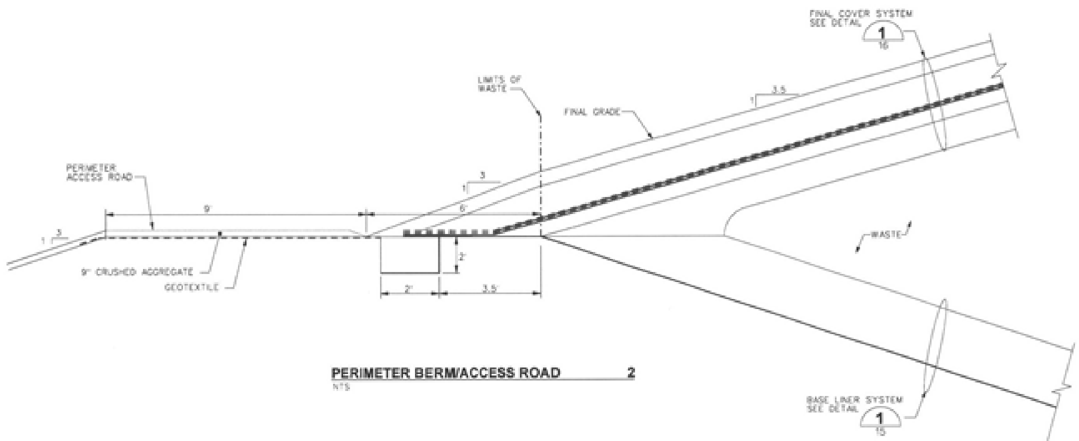
CELL 1 BASE LINER DETAILS

DATE	JANUARY 2009
PROJECT NO	95561
FILENAME	15cell1b.dgn
SHEET NO	
DRAWING NO	15



FINAL COVER SYSTEM 1

NTS



PERIMETER BERM/ACCESS ROAD 2

NTS

NO	REVISIONS	DRN	CHK	DATE

Sheboygan, Wisconsin

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ENGINEERING REPORT
PHASE II LATERAL EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

FINAL COVER LINER DETAILS

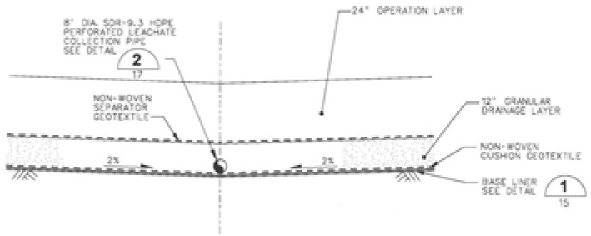
DATE JANUARY 2009

PROJECT NO 95561

FILENAME 16details.dgn

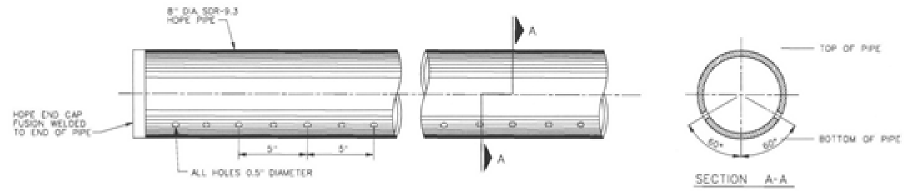
SHEET NO

DRAWING NO **16**



LEACHATE COLLECTION SYSTEM 1

NTS

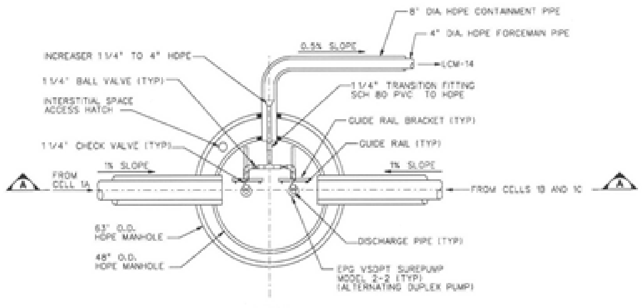


NOTE:

1. ALL HOLES TO BE ALTERNATELY STAGGERED.

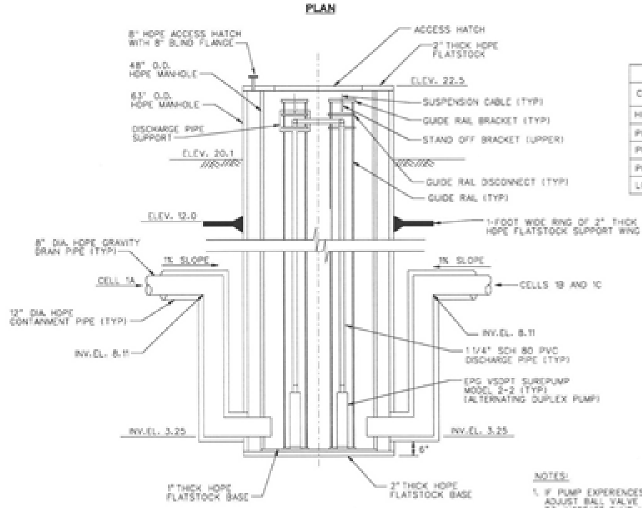
PERFORATED LEACHATE COLLECTION PIPE 2

NTS



8" DIA. HDPE CONTAINMENT PIPE
4" DIA. HDPE FORCEMAIN PIPE
INCREASER 1 1/4" TO 4" HDPE
0.5% SLOPE
LCM-14
1 1/4" BALL VALVE (TYP)
1 1/4" TRANSITION FITTING SCH 80 PVC TO HDPE
INTERSTITIAL SPACE ACCESS HATCH
GUIDE RAIL BRACKET (TYP)
1 1/4" CHECK VALVE (TYP)
GUIDE RAIL (TYP)
1% SLOPE
1% SLOPE
FROM CELL 1A
FROM CELLS 1B AND 1C
63" O.D. HDPE MANHOLE
48" O.D. HDPE MANHOLE
DISCHARGE PIPE (TYP)
EPG VSDPT SUREPUMP MODEL 2-2 (TYP) (ALTERNATING DUPLEX PUMP)

PLAN



8" HDPE ACCESS HATCH WITH 8" BLIND FLANGE
ACCESS HATCH
2" THICK HDPE FLATSTOCK
48" O.D. HDPE MANHOLE
63" O.D. HDPE MANHOLE
ELEV. 22.5
SUSPENSION CABLE (TYP)
GUIDE RAIL BRACKET (TYP)
DISCHARGE PIPE SUPPORT
STAND OFF BRACKET (UPPER)
ELEV. 20.1
GUIDE RAIL DISCONNECT (TYP)
GUIDE RAIL (TYP)
ELEV. 12.0
1-FOOT WIDE RING OF 2" THICK HDPE FLATSTOCK SUPPORT WING
8" DIA. HDPE GRAVITY DRAIN PIPE (TYP)
1% SLOPE
1% SLOPE
CELL 1A
CELLS 1B AND 1C
12" DIA. HDPE CONTAINMENT PIPE (TYP)
INV.EL. 8.11
INV.EL. 8.11
1 1/4" SCH 80 PVC DISCHARGE PIPE (TYP)
EPG VSDPT SUREPUMP MODEL 2-2 (TYP) (ALTERNATING DUPLEX PUMP)
INV.EL. 3.25
INV.EL. 3.25
6"
1" THICK HDPE FLATSTOCK BASE
2" THICK HDPE FLATSTOCK BASE

PUMP CONTROLS		
CONTROL ACTION	HEIGHT ABOVE FLOOR OF #3 WET WELL	ELEVATION FEET ABOVE MSL
HIGH LEVEL ALARM	7'-0"	10.0
PUMP 2 ON	5'-0"	8.0
PUMP 1 ON	4'-0"	7.0
PUMP(S) OFF	1'-2.25"	4.19
LOW LEVEL ALARM	1'-1.25"	4.11

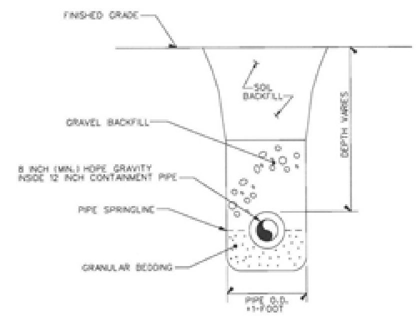
NOTES:

1. IF PUMP EXPERIENCES EXCESSIVE VIBRATION, ADJUST BALL VALVE BY FURTHER CLOSING TO INCREASE PUMP HEAD.

SECTION A-A

LEACHATE FORCEMAIN WET WELL #3 3

NTS



NOTE:

1. TRANSFER PIPE TO BE DOUBLE-WALLED PIPE, 8 INCH HDPE PIPE INSIDE 12 INCH CONTAINMENT PIPE.

LEACHATE TRANSFER PIPE (TYP) 4

NTS

NO | REVISIONS | DRN | CHK | DATE

Sheboygan, Wisconsin

DRN: DRB
DES: TCR/AKW
CHK: KJB
APP: KJB

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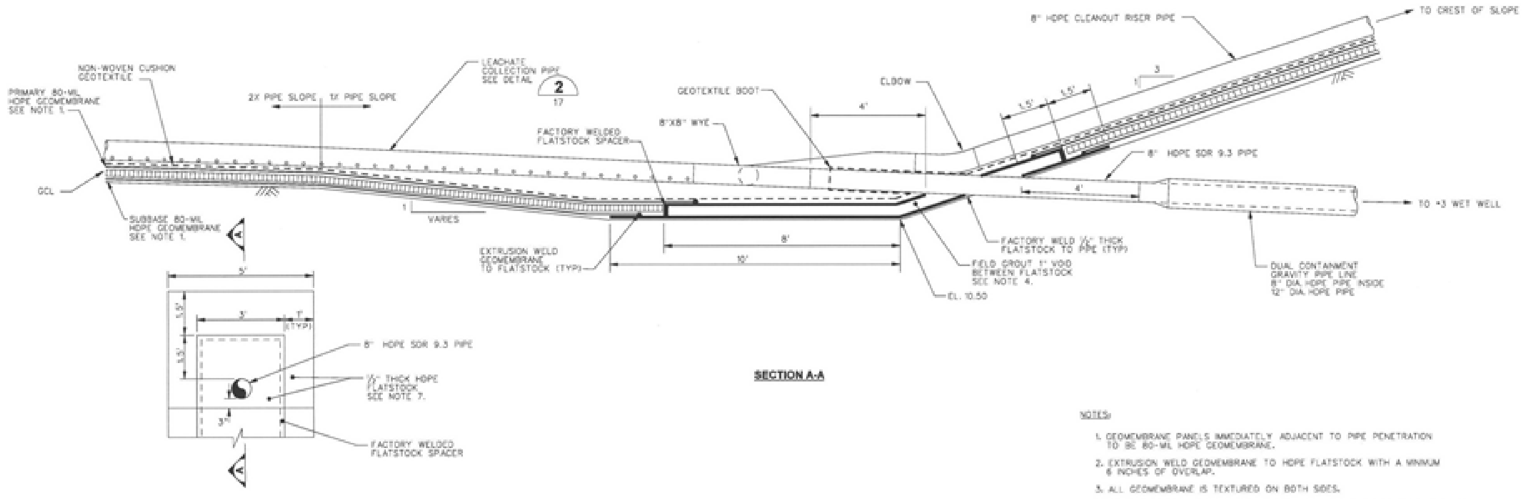
ENGINEERING REPORT
PHASE II LATERAL EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

CELL 1 LEACHATE MANAGEMENT SYSTEM DETAILS

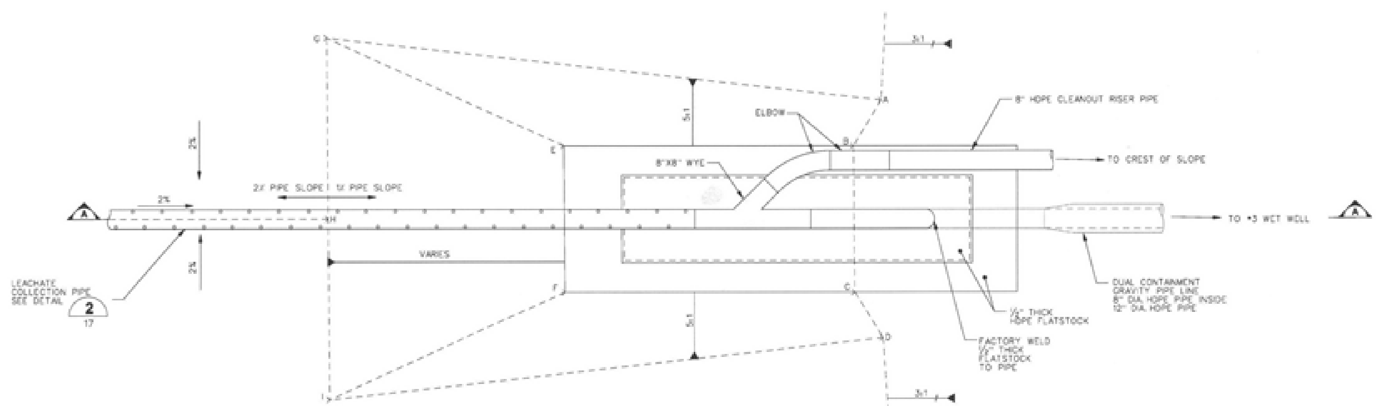
DATE: JANUARY 2009
PROJECT NO: 95561
FILENAME: 17details.dgn
SHEET NO:
DRAWING NO: 17


8" HDPE CLEANOUT RISER PIPE
TO CREST OF SLOPE
NON-WOVEN CUSHION GEOTEXTILE
PRIMARY 80-MIL HDPE GEOMEMBRANE SEE NOTE 1.
LEACHATE COLLECTION PIPE SEE DETAIL 2 17
2% PIPE SLOPE 1% PIPE SLOPE
GEOTEXTILE BOOT
ELBOW
FACTORY WELDED FLATSTOCK SPACER
8"X8" WYE
8" HDPE SDR 9.3 PIPE
GCL
SUBBASE 80-MIL HDPE GEOMEMBRANE SEE NOTE 1.
VARIES
TO #3 WET WELL
EXTRUSION WELD GEOMEMBRANE TO FLATSTOCK (TYP)
FACTORY WELD ½" THICK FLATSTOCK TO PIPE (TYP)
FIELD GROUT 1" VOID BETWEEN FLATSTOCK SEE NOTE 4.
EL. 10.50
DUAL CONTAINMENT GRAVITY PIPE LINE 8" DIA. HDPE PIPE INSIDE 12" DIA. HDPE PIPE
½" THICK HDPE FLATSTOCK SEE NOTE 7.
FACTORY WELDED FLATSTOCK SPACER
SECTION A-A
PLAN

PIPE PENETRATION DETAIL 1
NTS

NOTES:

1. GEOMEMBRANE PANELS IMMEDIATELY ADJACENT TO PIPE PENETRATION TO BE 80-MIL HDPE GEOMEMBRANE.
2. EXTRUSION WELD GEOMEMBRANE TO HDPE FLATSTOCK WITH A MINIMUM 6 INCHES OF OVERLAP.
3. ALL GEOMEMBRANE IS TEXTURED ON BOTH SIDES.
4. PIPE PENETRATION ASSEMBLY TO BE FACTORY AND FIELD AIR TESTED FOR WATER TIGHTNESS. FIELD GROUT AFTER SATISFACTORY AIR TESTING AND EXTRUSION WELD TEST/GROUT OPENINGS.
5. PLACE MULTIPLE LAYER OF GCL FOR EACH TRANSITION AND THICKNESS ALONG TOP FLATSTOCK.
6. PIPE CONNECTIONS TO BE FIELD CONNECTIONS USING ELECTRO-FUSION COUPLINGS.
7. ROUND ALL CORNERS AND EDGES OF FLATSTOCK.


ELBOW
8" HDPE CLEANOUT RISER PIPE
TO CREST OF SLOPE
8"X8" WYE
2% PIPE SLOPE 1% PIPE SLOPE
VARIES
TO #3 WET WELL
LEACHATE COLLECTION PIPE SEE DETAIL 2 17
DUAL CONTAINMENT GRAVITY PIPE LINE 8" DIA. HDPE PIPE INSIDE 12" DIA. HDPE PIPE
½" THICK HDPE FLATSTOCK
FACTORY WELD ½" THICK FLATSTOCK TO PIPE

PIPE PENETRATION GRADING PLAN 2
NTS

Subgrade Control Points

Cell 1A

Point	Northing	Easting	Elevation
A	55420.18	1555812.19	10.81
B	55420.69	1555813.94	10.50
C	55424.36	1555817.34	10.50
D	55426.15	1555817.72	10.81
E	55413.84	1555821.23	10.50
F	55417.51	1555824.63	10.50
G	55405.56	1555824.65	11.24
H	55410.11	1555826.85	11.11
I	55414.65	1555833.05	11.24

Cell 1B

Point	Northing	Easting	Elevation
A	55603.89	1555982.06	10.77
B	55604.33	1555983.59	10.50
C	55608.00	1555986.98	10.50
D	55609.54	1555987.31	10.77
E	55597.48	1555990.88	10.50
F	55601.16	1555994.27	10.50
G	55586.12	1555997.23	11.29
H	55590.84	1556001.60	11.16
I	55595.56	1556005.95	11.28

Cell 1C

Point	Northing	Easting	Elevation
A	55787.61	1556151.97	10.73
B	55787.96	1556153.23	10.50
C	55791.65	1556156.63	10.50
D	55792.93	1556156.90	10.72
E	55781.13	1556160.52	10.50
F	55784.80	1556163.92	10.50
G	55766.67	1556169.82	11.33
H	55771.57	1556174.34	11.20
I	55776.46	1556178.86	11.33

Cell 1D

Point	Northing	Easting	Elevation
A	55953.46	1556520.85	10.72
B	55952.21	1556521.16	10.50
C	55948.53	1556524.85	10.50
D	55948.57	1556526.09	10.72
E	55944.92	1556514.31	10.50
F	55941.54	1556518.00	10.50
G	55935.06	1556499.28	11.34
H	55930.54	1556504.23	11.21
I	55926.02	1556509.17	11.34

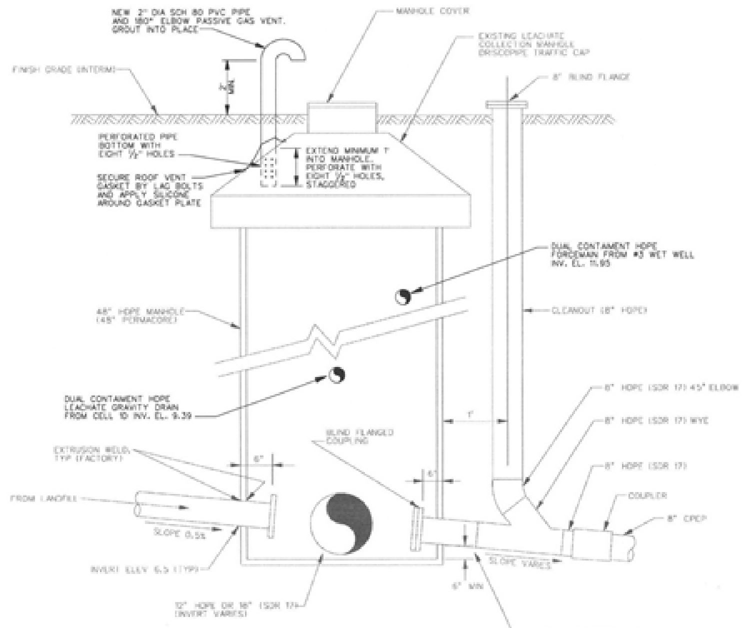
Sheboygan, Wisconsin

PREPARED BY AECOM

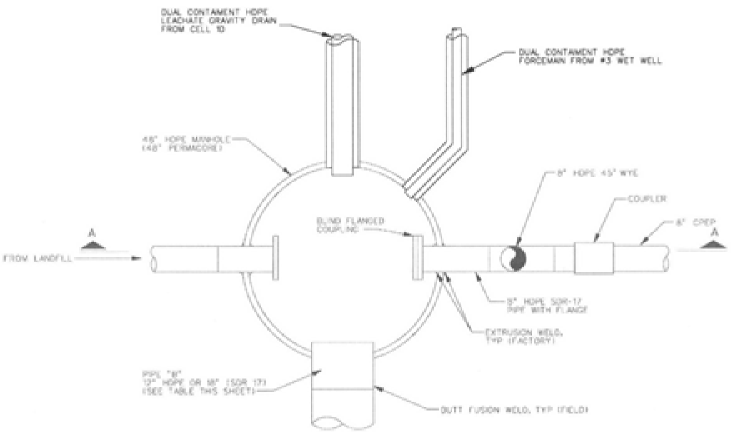
ENGINEERING REPORT
PHASE II LATERAL EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

CELL 1 LEACHATE MANAGEMENT SYSTEM DETAILS

DATE JANUARY 2009
PROJECT NO 95561
SHEET NO
DRAWING NO 18

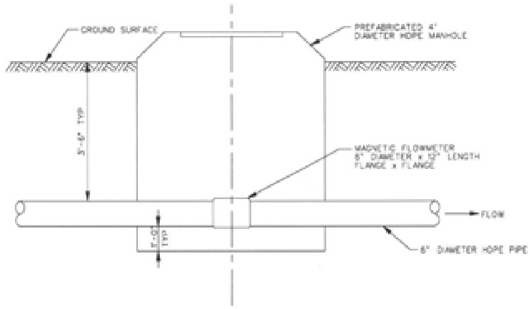

NEW 2" DIA SCH 80 PVC PIPE AND 180° ELBOW PASSIVE GAS VENT. GROUT INTO PLACE
MANHOLE COVER
EXISTING LEACHATE COLLECTION MANHOLE DRISCOPIPE TRAFFIC CAP
FINISH GRADE (INTERIM)
8" BLIND FLANGE
PERFORATED PIPE BOTTOM WITH EIGHT 1/2" HOLES
SECURE ROOF VENT GASKET BY LAG BOLTS AND APPLY SILICONE AROUND GASKET PLATE
EXTEND MINIMUM 1' INTO MANHOLE. PERFORATE WITH EIGHT 1/2" HOLES, STAGGERED
DUAL CONTAMENT HDPE FORCEMAIN FROM #3 WET WELL INV. EL. 11.95
48" HDPE MANHOLE (48" PERMACORE)
CLEANOUT (8" HDPE)
DUAL CONTAMENT HDPE LEACHATE GRAVITY DRAIN FROM CELL 10 INV. EL. 9.39
8" HDPE (SDR 17) 45° ELBOW
8" HDPE (SDR 17) WYE
EXTRUSION WELD, TYP (FACTORY)
BLIND FLANGED COUPLING
8" HDPE (SDR 17)
COUPLER
FROM LANDFILL
8" CPEP
SLOPE 0.5%
SLOPE VARIES
INVERT ELEV 6.5 (TYP)
6" MIN
12" HDPE OR 18" (SDR 17) (INVERT VARIES)
BUTT FUSION WELD (FIELD)

SECTION A-A
NTS

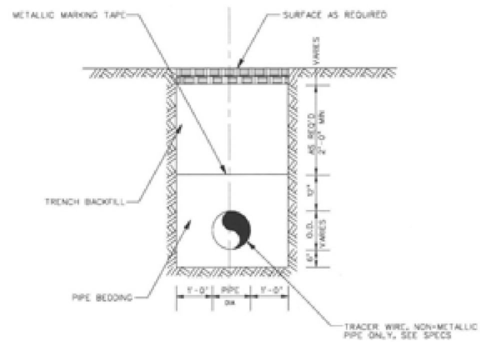

DUAL CONTAMENT HDPE LEACHATE GRAVITY DRAIN FROM CELL 10
DUAL CONTAMENT HDPE FORCEMAIN FROM #3 WET WELL
48" HDPE MANHOLE (48" PERMACORE)
8" HDPE 45° WYE
COUPLER
8" CPEP
BLIND FLANGED COUPLING
A
FROM LANDFILL
8" HDPE SDR-17 PIPE WITH FLANGE
EXTRUSION WELD, TYP (FACTORY)
PIPE "B" 12" HDPE OR 18" (SDR 17) (SEE TABLE THIS SHEET)
BUTT FUSION WELD, TYP (FIELD)

PLAN
NTS

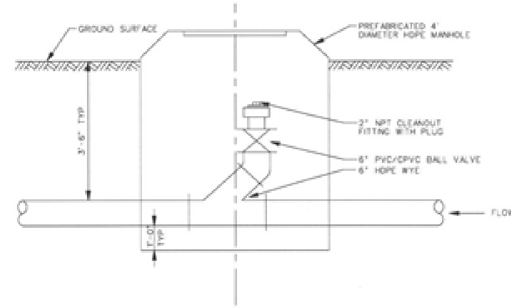
EXISTING LEACHATE COLLECTION MANHOLE 1
NTS



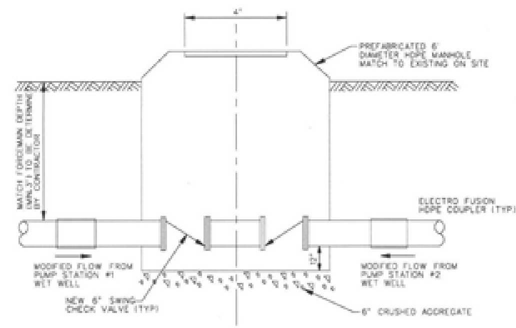
EXISTING LEACHATE FORCEMAIN FLOWMETER 2
NTS



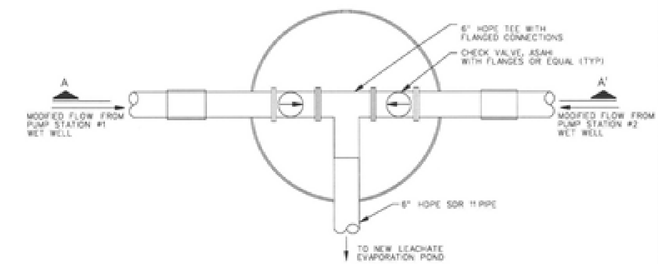
EXISTING FORCEMAIN TRENCH SECTION 4
NTS



EXISTING LEACHATE FORCEMAIN CLEANOUT 3
NTS


4'
PREFABRICATED 6' DIAMETER HDPE MANHOLE MATCH TO EXISTING ON SITE
MATCH FORCEMAIN DEPTH (MIN.) TO BE DETERMINED BY CONTRACTOR
ELECTRO FUSION HDPE COUPLER (TYP)
MODIFIED FLOW FROM PUMP STATION #1 WET WELL
MODIFIED FLOW FROM PUMP STATION #2 WET WELL
12"
NEW 6" SWING CHECK VALVE (TYP)
6" CRUSHED AGGREGATE

SECTION A-A'



PLAN

NEW LEACHATE FORCEMAIN VALVE BOX 5
NTS

GENERAL NOTE:

1. EXISTING DETAILS ARE BASED UPON DRAWINGS TITLED, "KEKAHA SANITARY LANDFILL, PHASE 2, KEKAHA, HAWAII", PREPARED BY HARDING LAWSON ASSOCIATES, DATED MARCH 1993.
2. MODIFY ALL EXISTING LEACHATE COLLECTION MANHOLES WITH PASSIVE GAS VENT PER DETAIL 1/19
3. LOCATIONS OF ALL MANHOLES AND ELEVATIONS PENDING FIELD SURVEY DOCUMENTATION.

NO	REVISIONS	DRN	CHK	DATE

Sheboygan, Wisconsin

DRN	DRB
DES	TER/MKW
CHK	KJB
APP	KJB

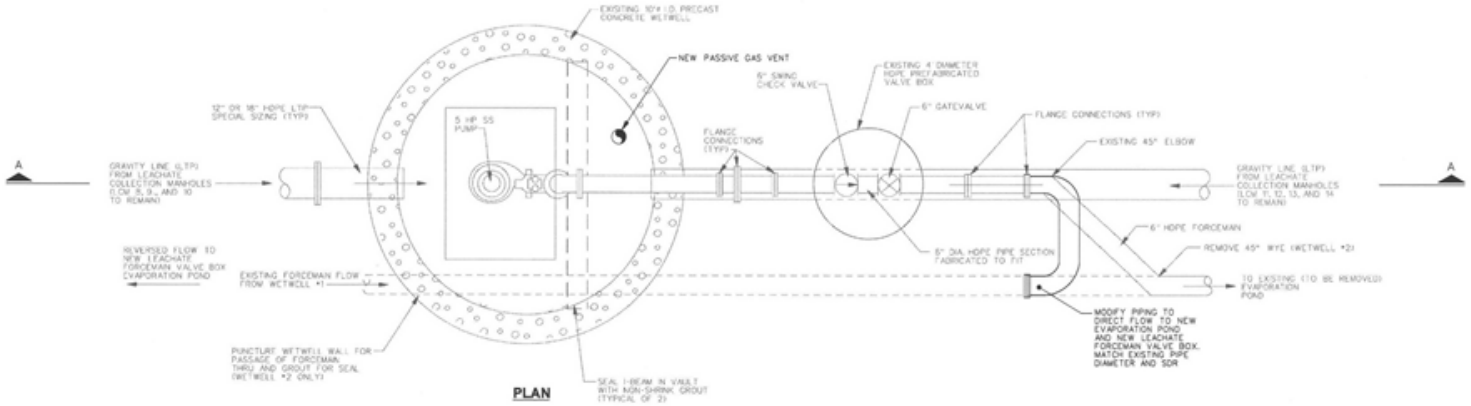
PREPARED BY

AECOM

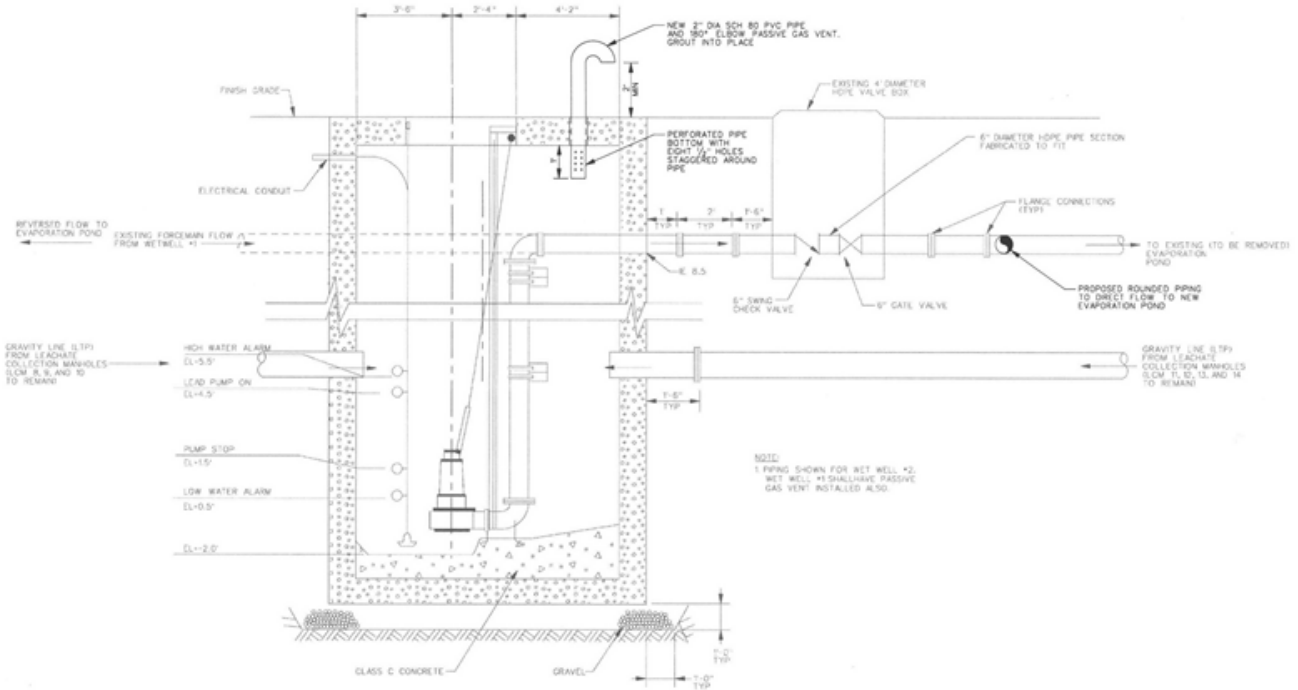
ENGINEERING REPORT
PHASE II LATERAL EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

EXISTING LEACHATE MANAGEMENT SYSTEM AND MODIFICATION DETAILS

DATE	JANUARY 2009
PROJECT NO	95561
FILENAME	19details.dgn
SHEET NO	
DRAWING NO	19



PLAN



SECTION A-A

NOTE:
1. PIPING SHOWN FOR WET WELL #2. WET WELL #1 SHALL HAVE PASSIVE GAS VENT INSTALLED ALSO.

GENERAL NOTE:
1. EXISTING DETAILS ARE BASED UPON DRAWINGS TITLED, "KEKAHA SANITARY LANDFILL, PHASE 2, KEKAHA, HAWAI'I", PREPARED BY HARDING LAWSON ASSOCIATES, DATED MARCH 1993.
2. MODIFY ALL EXISTING WET WELLS WITH PASSIVE GAS VENT AS SHOWN ON DETAIL 1.

EXISTING LEACHATE FORCEMAIN WET WELL #2 1
NTS

Shelbygan, Wisconsin
DRN DRB
DES TCB/NCM
CHK KJB
APP KJB

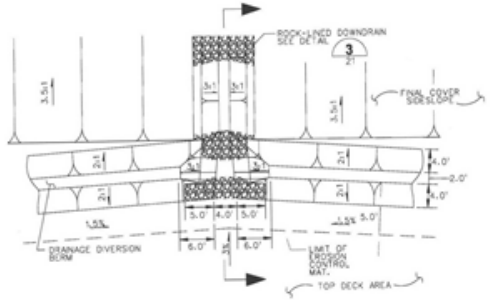
NO	REVISIONS	DRN	CHK	DATE

PREPARED BY
AECOM

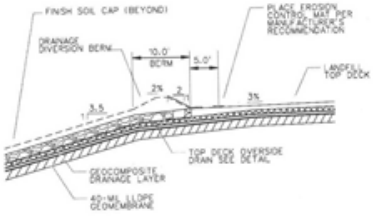
ENGINEERING REPORT
PHASE II LATERAL EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

EXISTING LEACHATE MANAGEMENT SYSTEM AND MODIFICATION DETAILS

DATE JANUARY 2009
PROJECT NO 95561
FILENAME 20details.dgn
SHEET NO
DRAWING NO 20



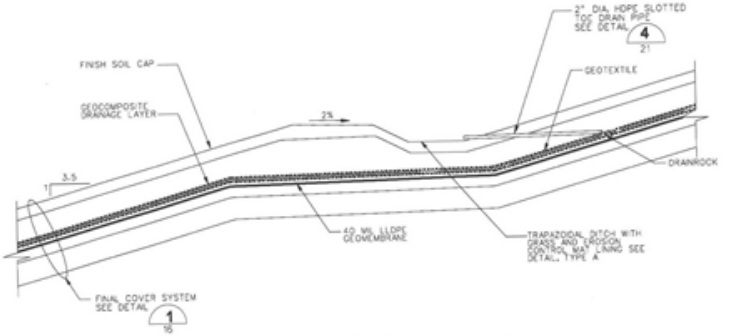
PLAN



PROFILE

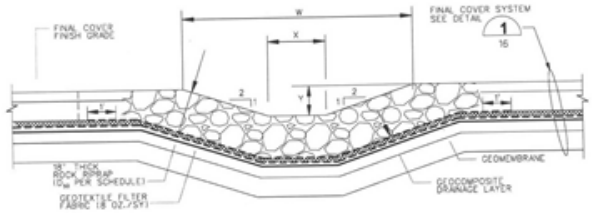
DIVERSION BERM/DOWNDRAIN TRANSITION 1

NTS



BENCH PROFILE DETAIL 2

NTS



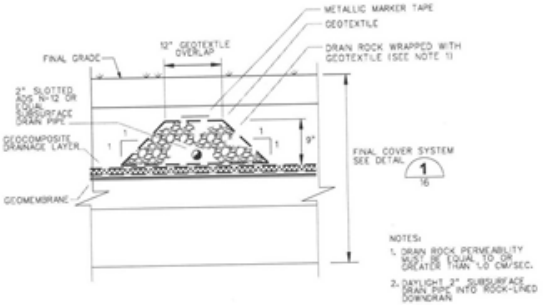
DOWNDRAIN SCHEDULE

FLUME	DIMENSION W (FT)	DIMENSION X (FT)	DIMENSION Y (FT)	RIPRAP SIZE (D_{50})	D_{50}	D_{50}
A	6.0	2.0	1.0	3	6	9
B	6.0	2.0	1.0	3	6	9
C	5.0	1.0	1.0	3	6	9
D	6.0	2.0	1.0	3	6	9
E	6.0	2.0	1.0	3	6	9
F	3.0	1.0	0.5	3	6	9

NOTE:
DOWNDRAIN LETTERS REFER TO FLUME DESIGNATIONS ON DRAWING NO. 8.

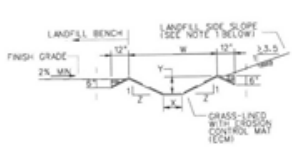
ROCK-LINED DOWNDRAIN DETAIL 3

NTS

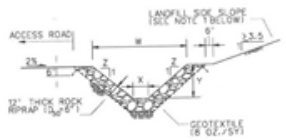


PIPE SUBDRAIN DETAIL 4

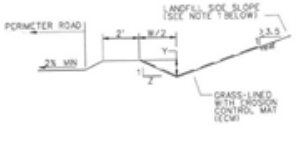
NTS



TYPE A DITCH, BENCH/TERRACE



TYPE B DITCH, ACCESS ROAD



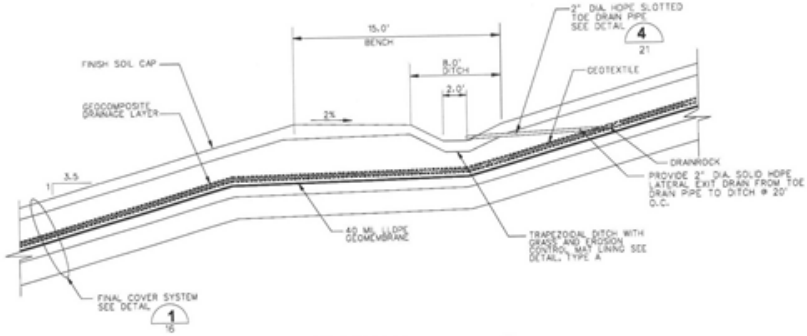
TYPE C DITCH, PERIMETER ROAD

NOTES:
1. PLACE HAY BALES OR SILT FENCE ADJACENT TO ALL DITCHES TO PREVENT SILT AND SEDIMENT FROM WASHING INTO DITCH UNTIL VEGETATION IS ESTABLISHED.

TYPE	DIMENSION W (FT)	DIMENSION X (FT)	DIMENSION Y (FT)	SIDE SLOPE Z	SHAPE	LINING
A	6.0	2.0	1.5	2.0	TRAPEZOIDAL	GRASS-LINED WITH ECM
B	9.5	1.0	1.5	3.5	TRAPEZOIDAL	ROCK RIPRAP
C	1.6	0	4.0	2.0	V-SHAPED	GRASS-LINED WITH ECM

DRAINAGE DITCH DETAIL 5

NTS



BENCH PROFILE DETAIL 6

NTS

	DRN	CHK	DATE
NO	REVISIONS		

Sheboygan, Wisconsin

DRN	DRB	
DES	TCR/MKB	
CHK	KJB	
APP	KJB	

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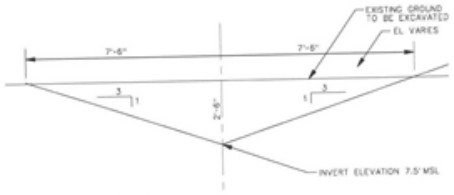
ENGINEERING REPORT
PHASE II LATERAL EXPANSION
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

SURFACE WATER MANAGEMENT SYSTEM DETAILS

DATE	JANUARY 2009
PROJECT NO	95561
FILENAME	21swsdts.dgn
SHEET NO	
DRAWING NO	21

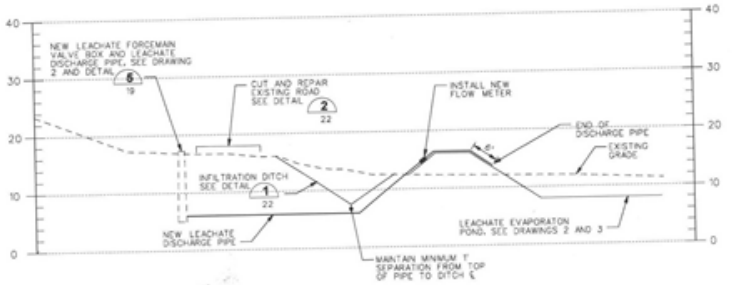


NOTE:

DITCH DIMENSIONS ARE MINIMUM AND MAY INCREASE DUE TO EXISTING GRADE.

INFILTRATION DITCH 1

NTS



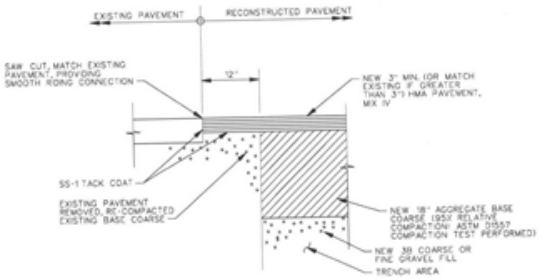
NOTES:

1. INSTALL NEW LEACHATE FORCEMAIN VALVE BOX AND LEACHATE DISCHARGE PIPE BASED UPON EXISTING FIELD CONNECTIONS AND MINIMUM DITCH SEPARATION SHOWN.

VERT: 0 10'
HORZ: 0 20'
SCALE

NEW LEACHATE FORCEMAIN VALVE BOX AND LEACHATE DISCHARGE PIPE SECTION 3

NTS



PAVEMENT CONNECTION DETAIL 2

NTS

		DRN	DATE
		CHK	
		DES	
		CHK	
		APP	
NO	REVISIONS		

Shelbyville, Wisconsin

DRN DRB
DES TOS/NKW
CHK KJB
APP KJB

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AECOM

ENGINEERING REPORT
PHASE II LATERAL EXPANSION
KEAAU SANITARY LANDFILL
KA'U, HAWAII

MISCELLANEOUS DETAILS

DATE	JANUARY 2009
PROJECT NO	95561
FILENAME	22details.dgn
SHEET NO	
DRAWING NO	22