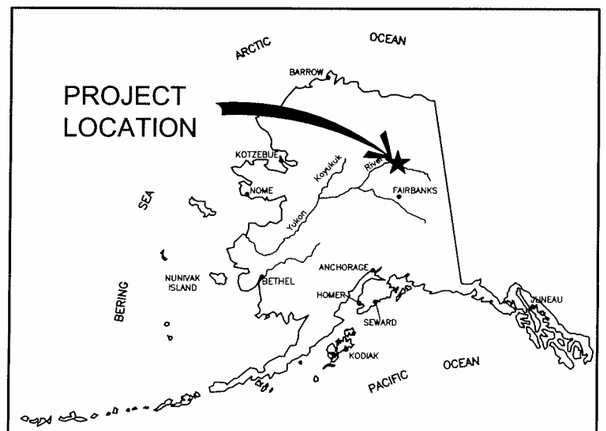
BEAVER, ALASKA
SANITATION IMPROVEMENTS

WASTEWATER LAGOON CONSTRUCTION

In Cooperation with the State of Alaska
Department of Environmental Conservation
VILLAGE SAFE WATER PROGRAM And
INDIAN HEALTH SERVICE



LOCATION MAP

Project Number (Consultant) 9966 (VSW) 16306
VSW Project Engineer ROGER BURLEIGH, PE
Contractor
Final Design (Date) JUNE 2004
ADEC Approval (Date) JUNE 28, 2004
Construction Period (From) JUNE 04 (To) SEPT. 04
As-Builts (Date)

PROJECT STATUS:

ISSUED FOR CONSTRUCTION

DATE:

MAY, 2005

⚠ LAGOON LAYOUT REVISION

CRW ENGINEERING GROUP, LLC
3900 Arctic Blvd. Suite 203-Anchorage, Alaska 99503
PHONE: (907) 562-3252-FAX: (907) 561-2273

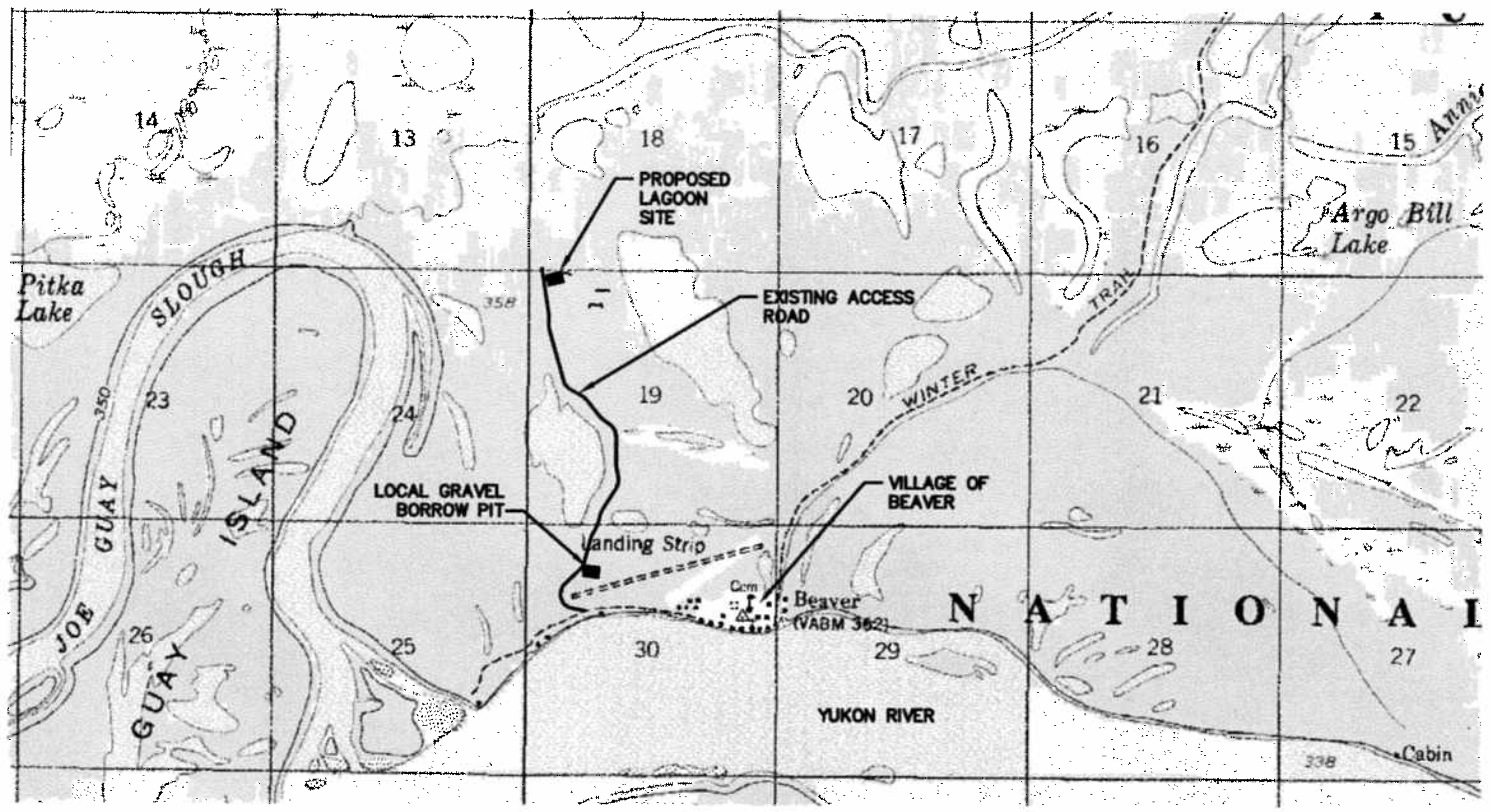
STATE OF ALASKA 49TH REGISTERED PROFESSIONAL ENGINEER DAVID S. YANOSHEK CE 9123

CONSULTANT

SHEET INDEX

SHT. NO.	DWG. NO.	TITLE
		GENERAL
1	G1	COVER SHEET
2	G2	LAGOON SITE PLAN AND GENERAL NOTES
3	G3	SURVEY CONTROL
4	G4	SITE CONTROL
		CIVIL
4	C1	LAGOON PLAN AND SECTIONS
5	C2	SECTIONS AND DETAILS
6	C3	FENCE DETAILS
7	C4	DISCHARGE LINE DETAILS
8	C5	PIPING AND VALVE DETAILS
9	C6	BIN WALL DETAILS

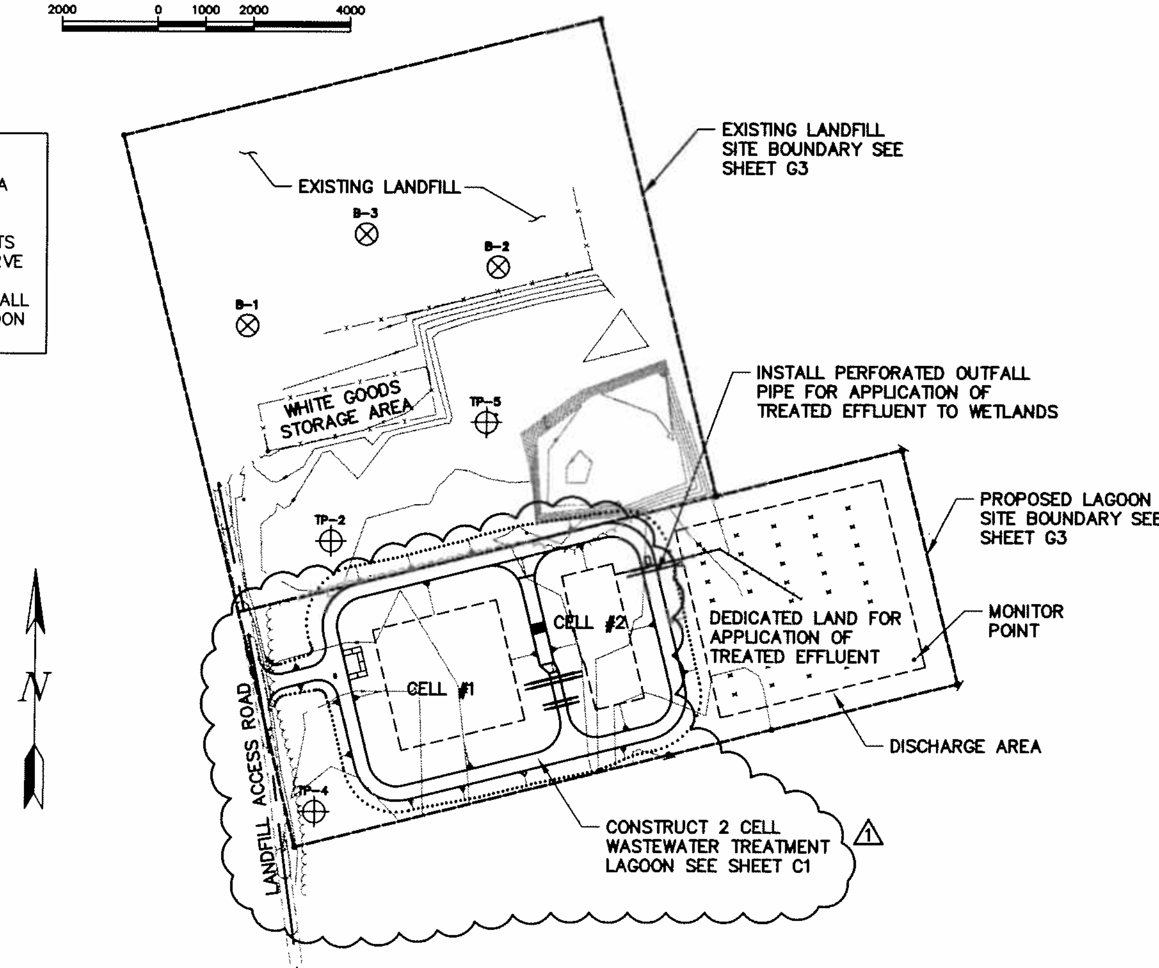
J:\Jobsdata\9966 Beaver\CADD\Drawings\Amendment 4 (Haul System)\Lagoon\Revised Lagoon\9966COVER.DWG



WASTEWATER LAGOON VICINITY MAP

2000 0 1000 2000 4000

PROJECT SCOPE AND NARRATIVE
THE BEAVER WASTEWATER LAGOON PROJECT CONSTRUCTS A NEW 1.2 MILLION GALLON, DUAL CELL WASTEWATER STABILIZATION POND AND ASSOCIATED STRUCTURES. BOTH LAGOON CELLS ARE SEALED BY IN-SITU, IMPERMEABLE SILTS AND PERMAFROST. A SEASONAL LAND DISCHARGE WILL SERVE AS FINAL DISPOSAL FOR THE WASTEWATER. ADDITIONAL PROJECT COMPONENTS INCLUDE THE ERECTION OF A BIN WALL PLATFORM TO FACILITATE DUMPING SEWAGE INTO THE LAGOON FROM PUMPER TRUCKS, FENCING, AND OUTFALL LINE.



WASTEWATER LAGOON WORK AREA SITE PLAN

100 0 50 100 200

GENERAL CONSTRUCTION NOTES

ALL CONSTRUCTION SHALL BE DONE IN A SAFE, WORKMANLIKE MANNER TO INDUSTRY STANDARDS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING A CLEAN SET OF AS-BUILT "REDLINE" RECORD DRAWINGS SHOWING THE LOCATION OF INSTALLED LAGOON DIKE, FENCE AND SWING TIES TO ALL VALVES. ALL ELEVATIONS SHALL BE MARKED ASB (AS-BUILT) OR FC (FIELD CHANGED) WITH A RED PENCIL ON A DAILY BASIS IN A NEAT AND LEGIBLE FASHION. A COPY OF THE AS-BUILT DRAWINGS SHALL BE SUBMITTED TO VSW AND THE VILLAGE OF BEAVER UPON COMPLETION OF THE WORK.

LEGEND

Symbol	Description
—⋈—▾—	PROPOSED WASTEWATER TRANSFER PIPE WITH VALVE
⁄⁄	EXISTING UNPAVED ROADWAY
——	RECORDED SITE BOUNDARY
---60---	CONTOUR LINE
—x—x—	FENCE
)(	EXISTING BRIDGE
◐	SURVEY CONTROL POINT
⊗	BORE HOLE
⊕	TEST PIT
◂	PROPOSED SIGN
NIC	NOT IN CONTRACT
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN

TEST PIT AND SOIL BORING LOGS

TEST PIT CONDUCTED BY DUANE MILLER AND ASSOCIATES IN FEBRUARY, 2003 BORE HOLES CONDUCTED BY SHANNON & WILSON IN JULY, 1995. BORE HOLE LOCATIONS ARE APPROXIMATE.

TEST PIT #2

0'–0.5' ORGANIC SILT: (OL) BROWN, FROZEN TO 0.2'

0.5'–2' SILT: (ML) BROWN, MOIST, MEDIUM STIFF, FROZEN AT 2'

TEST PIT #4

0'–2' SILT: (ML) BROWN, MOIST, FROZEN TO 0.5', w/ CLAY

2'–3' SILT: (ML) GREY-BROWN, MOIST, MEDIUM STIFF TO STIFF

TEST PIT #5

0'–0.4' SILT: (ML) BROWN, MOIST, FROZEN TO 0.5', w/ CLAY

0.4'–2.3' SILT: (ML) MOTTLED GRAY TO BROWN, MOIST, MEDIUM STIFF, w/ CLAY

BORE HOLE #1

0'–0.5' BROWN ORGANICS

0.5'–2.4' GREY, ORGANIC SILT WITH ORGANICS

2.4'–5.2' BROWN TO GREY, FINE SANDY, SILT TO SILTY FINE SAND; FROZEN, Nbe

5.2'–11.5' BROWN, SILTY TO SLIGHTLY SILTY SAND; FROZEN, NON/Nbe

BORE HOLE #2

0'–2.5' GREY, ORGANIC SILT WITH ORGANICS

2.5'–11.0' BROWN TO GREY, FINE SANDY SILT WITH OCCASIONAL ORGANICS; FROZEN, NON/Nbe

BORE HOLE #3

0'–0.5' BROWN ORGANICS

0.5'–2.8' GREY, ORGANIC SILT WITH ORGANICS

2.8'–14.0' BROWN TO GREY, SILT TO FINE SANDY SILT; FROZEN, Nbe, MINOR Vs

14.0'–20.5' GRAY, GRAVELLY SAND; FROZEN, Nbe–Vx

VILLAGE SAFE WATER

CRW ENGINEERING GROUP, LLC

VILLAGE OF BEAVER
WASTEWATER LAGOON CONSTRUCTION

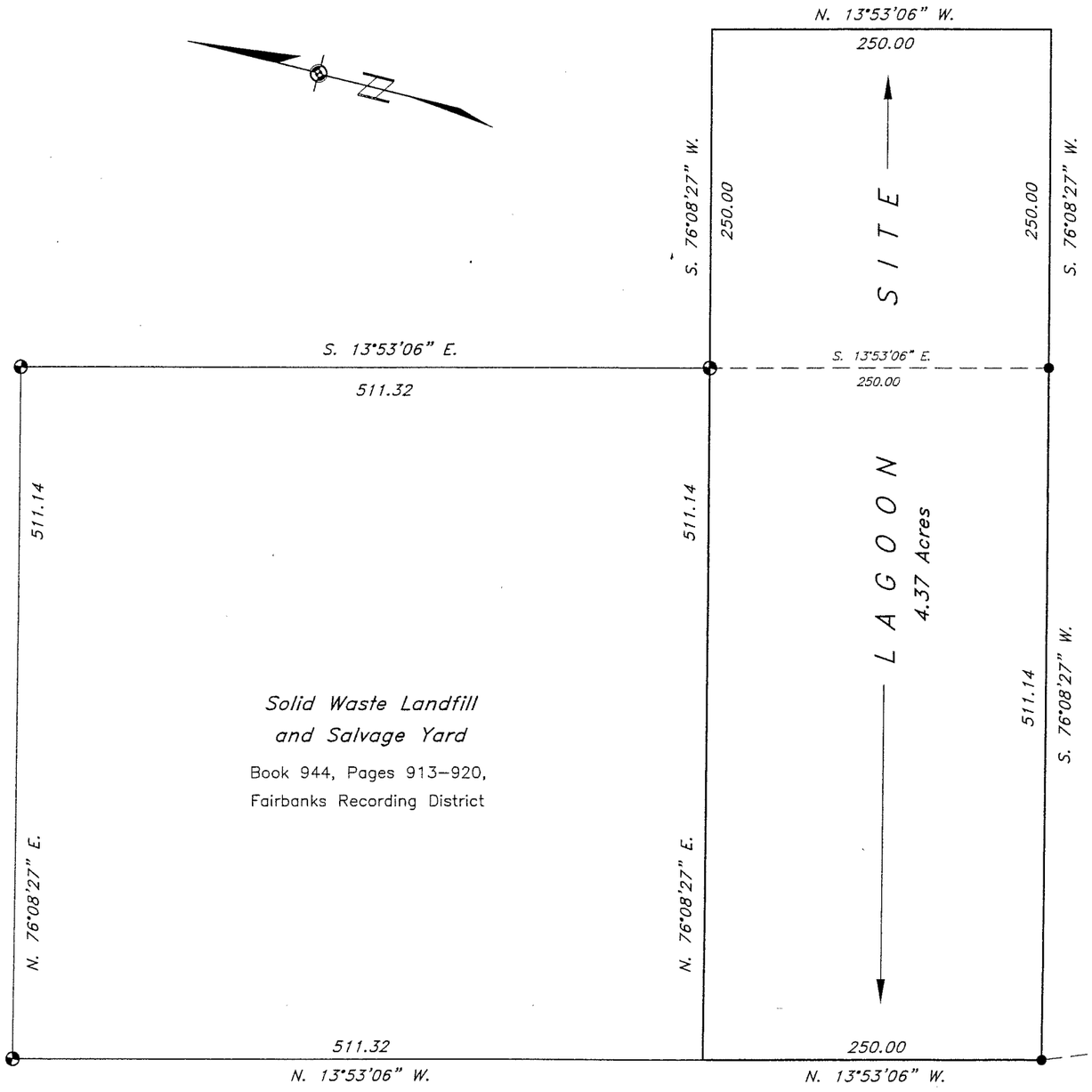
LAGOON SITE PLAN AND GENERAL NOTES

NO.	REVISION	BY	DATE
	35% SUBMITTAL	DSY	3/04
	ADEC APPROVAL SUBMITTAL	DSY	5/04
	ISSUED FOR CONSTRUCTION	DSY	6/04
1	LAGOON LAYOUT REVISION	DSY	5/05

Project No. 9966
Date JUNE 2004
Designed SMB
Drawn SMB
Approved DY

Sheet No. G2

File: 9966siteplan.dwg



Legend

- BLM Brass Capped Iron Pipe Monument USS 3798, Recovered This Survey
- Aluminum Primary Monument, 6484–S Recovered This Survey
- No. 5 Rebar With 2" Diameter Aluminum Cap 5032–S, Set This Survey

Graphic Scale

0 100 200 300
US SURVEY FEET

File: 9966mtssurvey.dwg

VILLAGE SAFE WATER

STATE OF ALASKA — 49th — RICHARD B. GRAY — No. LS 5032 — REGISTERED PROFESSIONAL

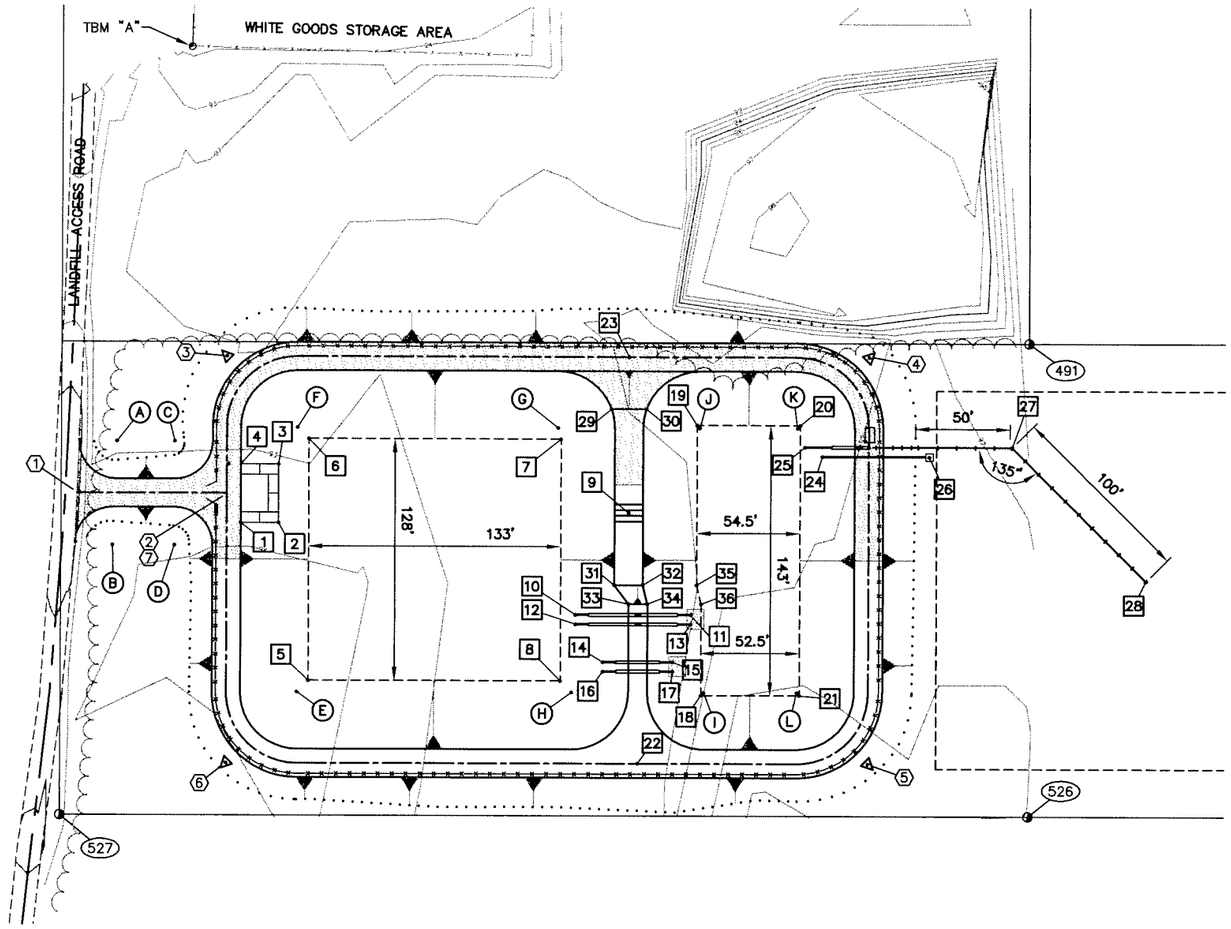
CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD. SUITE 203
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
FAX: (907) 561-2273

NATIVE VILLAGE OF BEAVER
WASTEWATER LAGOON
CONSTRUCTION
SURVEY CONTROL

NO.	REVISION	BY	DATE
	35% SUBMITTAL	DSY	3/04
	ADEC APPROVAL SUBMITTAL	DSY	5/04
	ISSUED FOR CONSTRUCTION	DSY	6/04

Project No. 9966
Date JUNE 2004
Designed RBG
Drawn EMG
Approved RBG

Sheet No. G3



RECOVERED MONUMENTS

CP	DESCRIPTION	COORDINATES NORTHING	COORDINATES EASTING
491	ALUMINUM PRIMARY MONUMENT	11,631.2563	1,663.9569
526	NO. 5 REBAR WITH 2" DIAMETER ALUMINUM CAP	11,388.5614	1,723.9503
527	NO. 5 REBAR WITH 2" DIAMETER ALUMINUM CAP	11,266.1251	1,227.6942

SURVEY CONTROL

1. FIELD SURVEY PERFORMED SEPTEMBER 2003.
2. HORIZONTAL COORDINATE SYSTEM IS A LOCAL ASSUMED SYSTEM. BASIS OF COORDINATE IS BLM BRASS CAPPED IRON PIPE MONUMENT AT CORNER NO. 7 OF U.S. SURVEY NO. 3798. N 5000.00 E 5000.00.
3. BASIS OF BEARING IS THE BLM RECORD BEARING OF N72°40'00"E FROM U.S. SURVEY NO. 3798 BETWEEN WCMC NO. 6 AND CORNER NO. 7.
4. BASIS OF VERTICAL DATUM IS BASED ON A SPIKE IN THE NORTH SIDE OF THE POWER POLE AT THE SOUTH SIDE OF THE INTERSECTION OF FIRST AVENUE AND C" STREET, SET APRIL 1999, ARBITRARY ELEVATION 100.00 FEET. TBM "A" IS THE TOP OF CONCRETE CYLINDER FENCE POST ANCHOR AT THE SOUTHWEST CORNER OF THE FENCE AROUND THE METAL REFUSE DISPOSAL AREA. ELEVATION 95.1 FEET.

LAGOON POINT SUMMARY ⚠1

NO.	NORTHING	EASTING	DESCRIPTION
1	11,438.7933	1,282.8600	BIN WALL CORNER
2	11,443.5840	1,302.2778	BIN WALL CORNER
3	11,473.6815	1,294.8521	BIN WALL CORNER
4	11,468.8908	1,275.4344	BIN WALL CORNER
5	11,366.4075	1,337.7985	CELL #1 BOTTOM CORNER
6	11,490.6810	1,307.1378	CELL #1 BOTTOM CORNER
7	11,522.5395	1,436.2657	CELL #1 BOTTOM CORNER
8	11,398.2659	1,466.9265	CELL #1 BOTTOM CORNER
9	11,490.3040	1,468.4235	OVERFLOW CHANNEL
10	11,434.1634	1,466.3098	PIPE END
11	11,448.7754	1,525.5340	PIPE END
12	11,429.3089	1,467.5075	PIPE END
13	11,443.9207	1,526.7317	PIPE END
14	11,413.3645	1,486.3762	PIPE END
15	11,422.2274	1,522.2990	PIPE END
16	11,408.5101	1,487.5739	PIPE END
17	11,417.3729	1,523.4967	PIPE END
18	11,408.8299	1,541.0541	CELL #2 BOTTOM CORNER
19	11,547.0679	1,504.3731	CELL #2 BOTTOM CORNER
20	11,560.1227	1,557.2864	CELL #2 BOTTOM CORNER
21	11,421.2859	1,591.5402	CELL #2 BOTTOM CORNER
22	11,365.8537	1,517.1533	MIDDLE DIKE
23	11,573.3962	1,460.7969	MIDDLE DIKE
24	11,546.8578	1,572.4040	PIPE END
25	11,549.5564	1,562.4683	PIPE END
26	11,560.2858	1,627.2659	OUTFALL SPLASH PAD
27	11,575.8521	1,668.5276	45° BEND
28	11,523.9773	1,754.1416	PIPE END
29	11,544.4895	1,458.4375	GRADE BREAK EL 95.5
30	11,548.9046	1,476.3324	GRADE BREAK EL 95.5
31	11,454.3653	1,482.4403	GRADE BREAK EL 95.5
32	11,457.9584	1,497.0036	GRADE BREAK EL 95.5
33	11,446.4530	1,492.1173	GRADE BREAK EL 98.0
34	11,448.8484	1,501.8262	GRADE BREAK EL 98.0
35	11,464.7855	1,524.6736	CELL #2 BOTTOM TRANSITION
36	11,455.6755	1,529.4964	CELL #2 BOTTOM TRANSITION

CENTERLINE ALIGNMENT SUMMARY ⚠1

P.I. DATA P.I.	NORTHING	EASTING	P.I. STA	TANGENT DATA BEARING	LENGTH	CURVE DATA DELTA	RADIUS	TANGENT	LENGTH
1	11433.2109	1195.2710	10+00.00						
2	11452.1138	1271.8833	10+78.88	N76°08'27"E	78.88				
3	11522.5026	1254.5160	11+43.34	N13°51'34"W	35.00	90°00'00"	37.50	37.50	58.90
4	11603.6978	1583.6148	14+66.23	N13°51'33"W	37.50	90°00'00"	37.50	37.50	58.90
5	11394.9575	1635.1157	16+65.14	N76°08'27"E	301.36	90°00'00"	37.50	37.50	58.90
6	11313.7625	1306.0193	19+88.03	N75°55'27"E	37.64	90°00'00"	37.50	37.50	58.90
7	11567.2892	1592.5975	21+22.50	S13°51'33"E	37.64				

RADIUS POINT DATA ⚠1

NO.	RADIUS	LENGTH	NORTHING	EASTING
A	20.00'	31.99'	11,464.8928	1,208.8755
B	20.00'	29.88'	11,410.9679	1,219.9176
C	20.00'	30.65'	11,472.2291	1,238.6108
D	20.00'	31.42'	11,418.8187	1,251.7386
E	30.00'	47.12'	13,359.1149	1,333.4106
F	30.00'	47.12'	11,495.0691	1,299.8751
G	30.00'	47.12'	11,528.0055	1,433.3721
H	30.00'	47.12'	11,393.8780	1,474.1892
I	30.00'	47.12'	11,410.6455	1,542.1510
J	30.00'	47.12'	11,545.9712	1,506.1885
K	30.00'	47.12'	11,558.3072	1,556.1892
L	30.00'	47.12'	11,422.3830	1,589.7247

VILLAGE SAFE WATER

STATE OF ALASKA — David S. Yamane — 49 PA — REGISTERED PROFESSIONAL ENGINEER

CRW ENGINEERING GROUP, LLC
3900 ARCTIC BLVD. SUITE 203
ANCHORAGE, ALASKA 99503
PHONE: (907) 561-1255
FAX: (907) 561-2273

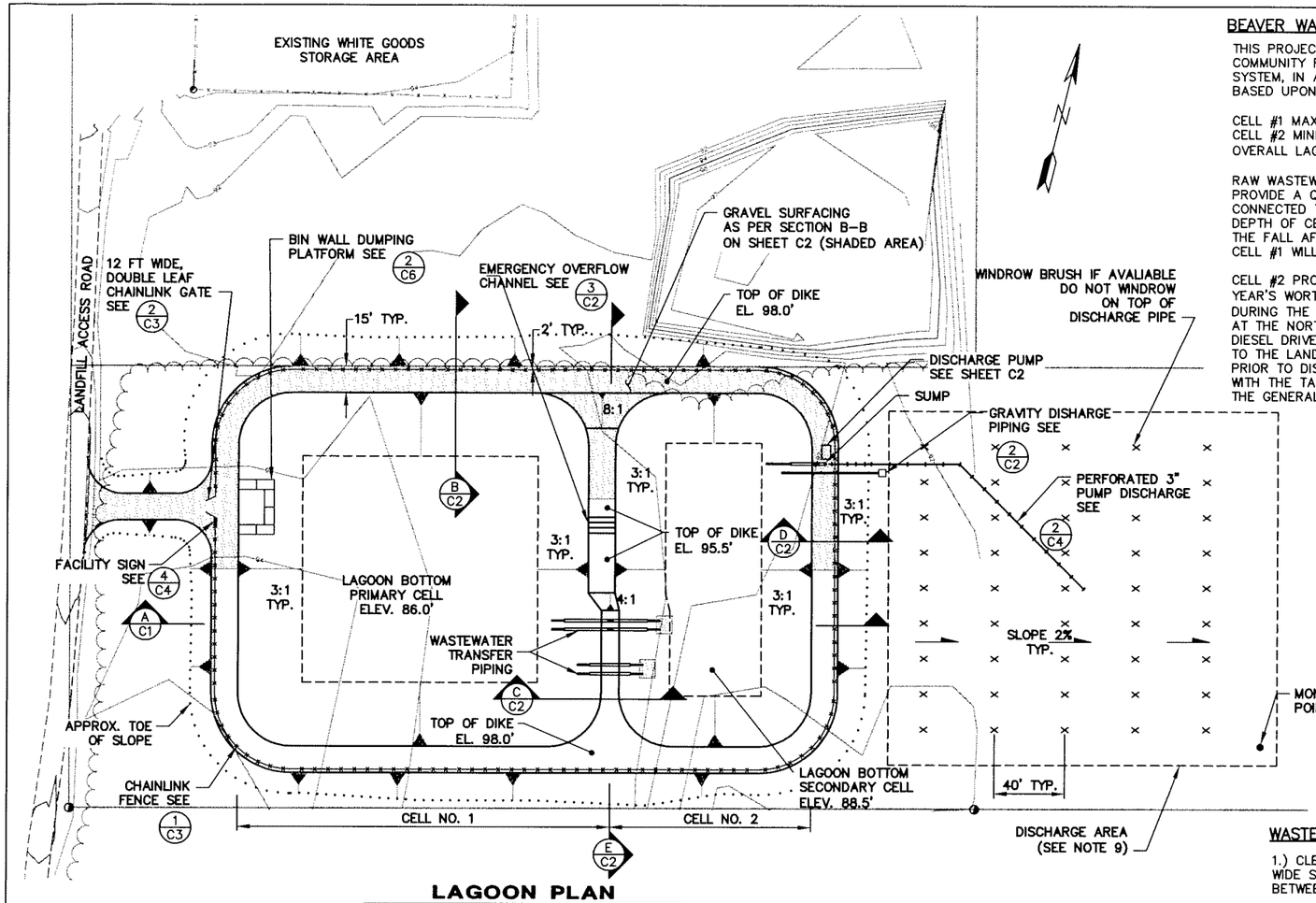
VILLAGE OF BEAVER
WASTEWATER LAGOON
CONSTRUCTION
SITE CONTROL

NO.	REVISION	BY	DATE
	35% SUBMITTAL	DSY	3/04
	ADEC APPROVAL SUBMITTAL	DSY	5/04
	ISSUED FOR CONSTRUCTION	DSY	6/04
⚠1	LAGOON LAYOUT REVISION	DSY	5/05

Project No. 9966
Date JUNE 2004
Designed SMB
Drawn SMB
Approved DY

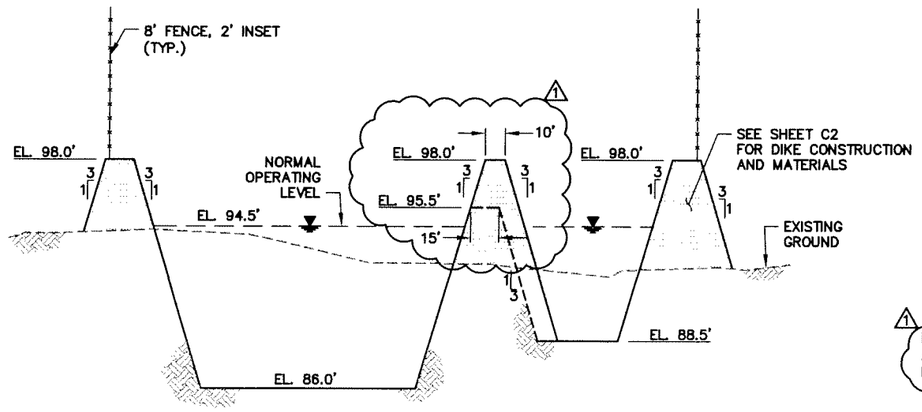
Sheet No. G4

File: J:\Jobsdata\9966 Beaver\CADD\Drawings\Amendment 4 (Haul System)\Lagoon\Revised Lagoon\9966surveycontrol-R6.dwg



LAGOON PLAN

HORIZONTAL SCALE: 40 0 20 40



SECTION A-A

HORIZONTAL SCALE: 40 0 20 40

VERTICAL SCALE: 4 0 2 4

1 EXTENDED DIKES 20' EAST, 10' NORTH, AND 10' SOUTH. LOWERED DIVIDER DIKE BY 2.5'

BEAVER WASTEWATER TREATMENT LAGOON OPERATIONAL NARRATIVE

THIS PROJECT CONSTRUCTS A TWO-CELL LAGOON FOR THE TREATMENT OF DOMESTIC WASTEWATER FROM THE BEAVER COMMUNITY FLUSH TANK AND HAUL SYSTEM. THE LAGOON HAS BEEN DESIGNED TO OPERATE AS A SEASONAL DISCHARGE SYSTEM, IN ACCORDANCE WITH ADEC WASTEWATER GENERAL PERMIT NO. 9940-DB004. LAGOON SIZING CALCULATIONS WERE BASED UPON THE FOLLOWING ADEC DESIGN CRITERIA:

CELL #1 MAXIMUM DESIGN LOADING: 30 LBS BOD5/ACRE/DAY
CELL #2 MINIMUM STORAGE: 365 DAYS
OVERALL LAGOON MAXIMUM LOADING: 20 LBS BOD5/ACRE/DAY

RAW WASTEWATER WILL BE INPUT INTO LAGOON CELL #1 VIA THE COMMUNITY'S SEWAGE HAUL TANK TRUCK. CELL #1 WILL PROVIDE A QUIESCENT SETTLING ZONE FOR SOLIDS CAPTURE AND SUBSEQUENT DIGESTION. CELL #1 IS HYDRAULICALLY CONNECTED TO CELL #2 VIA PIPELINES THROUGH THE EARTHEN SEPARATION DIKE. DURING NORMAL OPERATIONS, THE LIQUID DEPTH OF CELL #1 WILL MATCH THE LIQUID DEPTH IN CELL #2. OPERATING LEVEL IN BOTH CELLS WILL RANGE FROM 91.5 IN THE FALL AFTER THE SEASONAL DISCHARGE TO 94.5 MAXIMUM LEVEL JUST PRIOR TO DISCHARGE. LIQUID BELOW LEVEL 91.5 IN CELL #1 WILL REMAIN IN THE CELL AND PROVIDE DILUTION AND SEDIMENTATION.

CELL #2 PROVIDES ADDITIONAL OPPORTUNITY FOR BIOLOGICAL TREATMENT TO OCCUR, AND IS DESIGNED TO STORE OVER A YEAR'S WORTH OF WASTEWATER AT DESIGN FLOW. THE LIQUID LEVEL IN CELL #2 WILL VARY BETWEEN ELEVATIONS 90 AND 94.5 DURING THE YEAR. ONCE EACH FALL, CELL #2 WILL BE EMPTIED BY OPENING THE DRAIN VALVE (ELEVATION 92.5) LOCATED AT THE NORTHEAST CORNER OF CELL #2. FLUID WHICH CANNOT BE DRAINED BY GRAVITY WILL BE PUMPED OUT USING A DIESEL DRIVEN DEWATERING PUMP SUPPLIED BY THE PROJECT. TREATED EFFLUENT WITHDRAWN FROM CELL #2 WILL BE APPLIED TO THE LAND SURFACE EAST OF THE LAGOON IN ACCORDANCE WITH GENERAL PERMIT 9940-DB004. PRIOR TO DISCHARGING, THE OPERATOR SHALL COLLECT AND TEST SAMPLES OF THE WASTEWATER IN CELL #2 IN ACCORDANCE WITH THE TABLES IN THE GENERAL PERMIT. SAMPLES SHOULD BE COLLECTED FROM THE NORTHEAST CORNER OF CELL #2. THE GENERAL PERMIT ALLOWS FOR THE LAGOON CELL TO BE DISCHARGED UP TO TWICE PER YEAR

DESIGN CRITERIA

CURRENT POPULATION:	85
DESIGN POPULATION:	100
AVERAGE FLOW:	5 GPCD (FLUSH TANK AND HAUL SYSTEM)
AVERAGE BOD PRODUCTION:	0.17 LB/CAP-DAY

DESIGN REQUIREMENTS

MAX. BOD5 LOADING (PRIMARY):	30# BOD/ACRE DAY
MAX. BOD5 LOADING (TOTAL):	20# BOD/ACRE DAY

PRIMARY LAGOON (CELL #1)		SECONDARY LAGOON (CELL #2)	
SURFACE AREA DESIGN:	0.61 ACRES	SURFACE AREA DESIGN:	0.24 ACRES
LIQUID VOLUME: (4 FT USEABLE DEPTH, 2 FT SLUDGE STORAGE)	158,000 CF	LIQUID VOLUME: (5 FT USEABLE DEPTH)	36,880 CF
DETENTION TIME PRESENT:	1,624 DAYS	DETENTION TIME PRESENT:	649 DAYS
DETENTION TIME DESIGN:	1,380 DAYS	DETENTION TIME DESIGN:	552 DAYS
BOD5 LOADING PRESENT:	24# BOD/ACRE DAY		
BOD5 LOADING DESIGN:	28# BOD/ACRE DAY		

TOTAL LAGOON (CELL #1 AND #2)

BOD5 LOADING PRESENT:	17# BOD/ACRE DAY
BOD5 LOADING DESIGN:	20# BOD/ACRE DAY

WASTEWATER TREATMENT LAGOON CONSTRUCTION NOTES:

1.) CLEAR AND GRUB THE PROPOSED LAGOON FOOTPRINT TO EXPOSE IN-SITU INORGANIC SILTS. SCARIFY A MINIMUM 15 FT WIDE STRIP AROUND THE PROPOSED DIKE PERIMETER, CENTERED BENEATH THE DIKE CENTERLINE, TO PROMOTE BONDING BETWEEN IN-SITU AND EMBANKMENT SOILS.

2.) STOCKPILE SUFFICIENT AMOUNTS OF GRUBBED MATERIAL ALONG THE OUTER PERIMETER OF THE DIKE TO COMPLETE EMBANKMENT CONSTRUCTION AS SHOWN ON SHEET C2. EXCESS GRUBBED MATERIAL SHALL BE MOVED TO THE DESIGNATED STOCKPILE AREA. REMOVE LARGE WOODY DEBRIS.

3.) MINE INORGANIC SILTS FOR DIKE CONSTRUCTION FROM WITHIN THE PROPOSED LAGOON FOOTPRINT. DO NOT EXCAVATE BELOW THE BOTTOM OF LAGOON ELEVATION SHOWN ON THE PLANS.

4.) CONSTRUCT EMBANKMENT "CORE" FROM INORGANIC SILTS IN ACCORDANCE WITH THE SECTIONS SHOWN ON SHEET C2 AND THE SPECIFICATIONS. APPLY GRUBBED ORGANIC SILT MATERIAL TO EXTERIOR SLOPES AS SHOWN.

5.) COMPACT EMBANKMENT FILL IN 12" MAX LIFTS TO 90% OF MODIFIED PROCTOR MAX. DRY DENSITY.

6.) WETTED DIKE SLOPES SHALL NOT BE STEEPER THAN 1 FOOT VERTICAL TO 3 FEET HORIZONTAL. OTHER SLOPES TO BE CONSTRUCTED AS SHOWN.

7.) APPLY FERTILIZER AND SEED TO EXTERIOR DIKE SURFACES IN ACCORDANCE WITH THE FOLLOWING SPECIFICATION. IT IS THE INTENT OF THESE PLANS TO ESTABLISH A SLOPE STABILIZING ROOT MAT ON ALL SLOPES.

SEED SPECIFICATION

THE FOLLOWING SEED MIXTURE SHALL BE APPLIED AT A RATE OF 40 POUNDS PER ACRE:

SEED	PROPORTION	METHOD
BERING HAIRGRASS (NORCOAST)	60% BY WEIGHT	BROADCAST
ARCTARED RED FESCUE	35% BY WEIGHT	BROADCAST
ANNUAL RYE GRASS	5% BY WEIGHT	BROADCAST

THE FOLLOWING FERTILIZER MIXTURE SHALL BE APPLIED AT A RATE OF 450 POUNDS PER ACRE:

FERTILIZER:	
TOTAL N	20% BY WEIGHT
PHOSPHORIC ACID	20% BY WEIGHT
SOLUBLE POTASH	10% BY WEIGHT

8.) INSTALL GRAVEL BENEATH AND AROUND PIPE PENETRATIONS AS NECESSARY TO PREVENT EROSION. SEE LAGOON PLAN THIS SHEET.

9.) DISCHARGE AREA SHALL ONLY BE DEVELOPED AS NECESSARY TO PROVIDE BORROW MATERIAL.

VILLAGE SAFE WATER

CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD. SUITE 203
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
FAX: (907) 561-2273

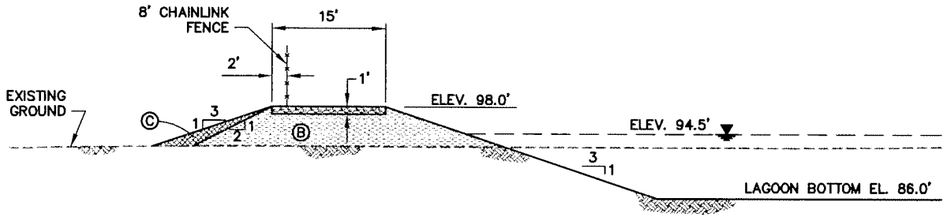
NATIVE VILLAGE OF BEAVER
WASTEWATER LAGOON CONSTRUCTION
LAGOON PLAN AND SPECIFICATIONS

NO.	REVISION	BY	DATE
	35% SUBMITTAL	DSY	3/04
	ADEC APPROVAL SUBMITTAL	DSY	5/04
	ISSUED FOR CONSTRUCTION	DSY	6/04
1	LAGOON LAYOUT REVISION	DSY	5/05

Project No. 9966
Date JUNE 2004
Designed SMB
Drawn SMB
Approved DY

Sheet No. C1

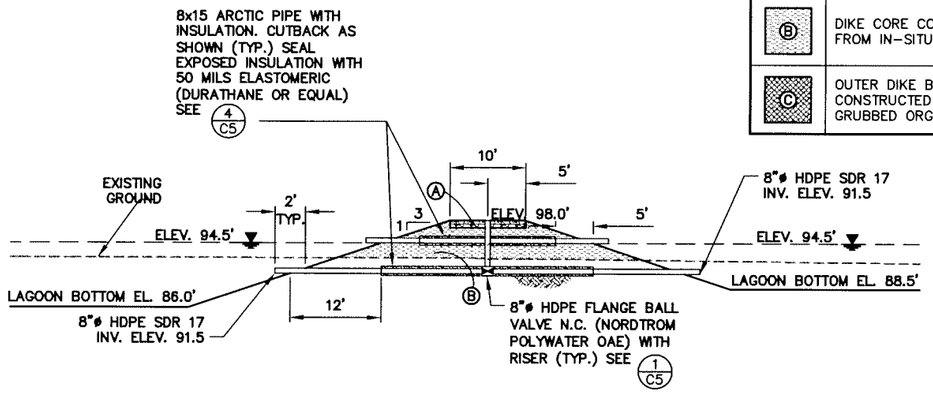
File: 9966lagoondesign.dwg



TYPICAL BERM SECTION B-B

10 0 5 10
HORIZONTAL/VERTICAL SCALE

MATERIAL TYPES	
TYPE	DESCRIPTION
A	GRAVEL FROM LOCAL GRAVEL PIT SEE NOTE
B	DIKE CORE CONSTRUCTED FROM IN-SITU SILTS
C	OUTER DIKE BERMS CONSTRUCTED FROM GRUBBED ORGANIC SILTS

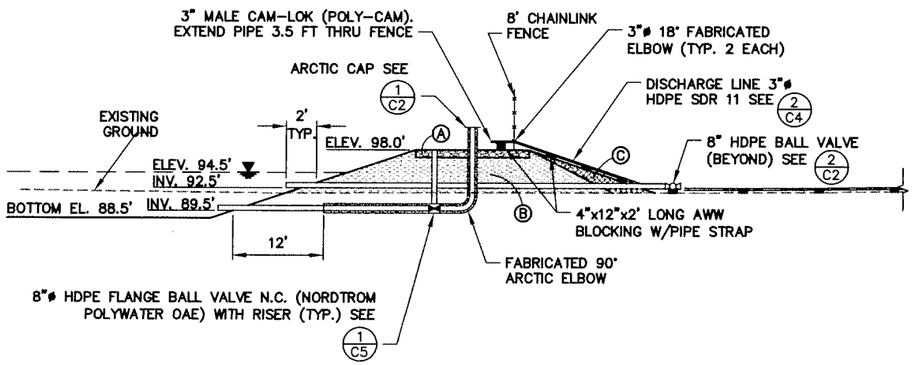


TYPICAL BERM SECTION C-C

SHOWING WASTEWATER TRANSFER PIPING

NOTE: DOUBLE PIPES ARE PROVIDED IN CASE ONE SET BECOMES BLOCKED OR DAMAGED

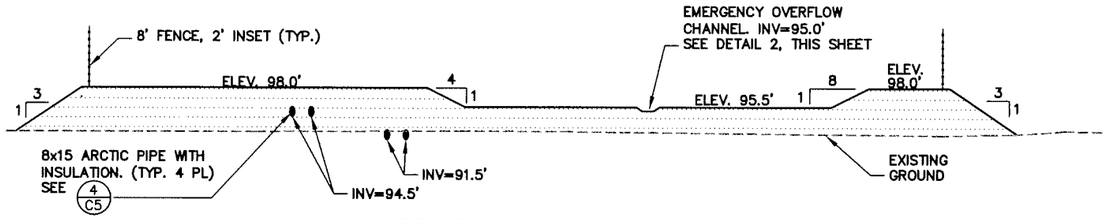
10 0 5 10
HORIZONTAL/VERTICAL SCALE



TYPICAL BERM SECTION D-D

SHOWING WASTEWATER PUMPING SUMP

10 0 5 10
HORIZONTAL/VERTICAL SCALE

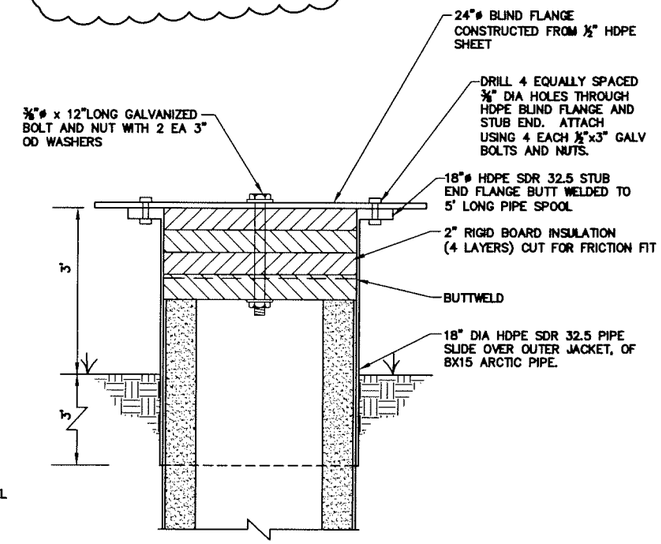


CENTER BERM SECTION E-E

20 0 10 20
HORIZONTAL SCALE

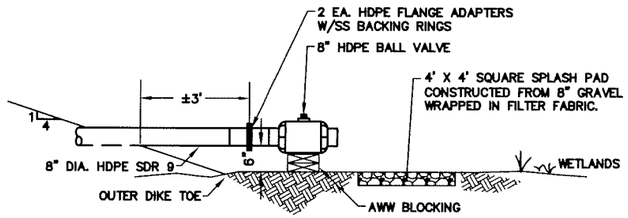
10 0 5 10
VERTICAL SCALE

1 SECTION ADDED TO REFLECT NEW LAGOON LAYOUT



1/C2 ARCTIC CAP DETAIL

NTS

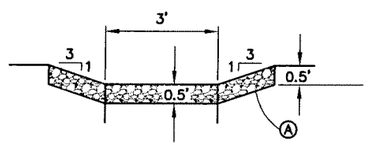


2/C2 GRAVITY DRAIN - OUTLET DETAIL

NTS

GRAVITY DRAIN NOTE:

IT IS THE INTENT OF THESE PLANS TO ALLOW THE EXPOSED END OF THE HDPE GRAVITY DRAIN LINE AND VALVE TO FREEZE DURING COLD MONTHS. THE UNINSULATED HDPE PIPE AND VALVE WILL THAW IN THE SPRING TO ALLOW GRAVITY DRAINAGE OF APPROXIMATELY 2.5 FT OF STORAGE.



3/C2 EMERGENCY OVERFLOW CHANNEL

NTS

TRAILER MOUNTED DISCHARGE PUMP SPECIFICATION

PROVIDE A DIESEL DRIVEN, SELF PRIMING CENTRIFUGAL PUMP IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS: (GODWIN MODEL CD75, OR APPROVED EQUAL)

1. THE PUMP SHALL BE A NEW, CLOSE-COUPLED, CENTRIFUGAL PUMP WITH VACUUM PRIMING COMPRESSION MOUNTED TO A DIESEL ENGINE.
2. PUMP SHALL INCORPORATE A DRY-RUNNING, OR BATH MECHANICAL SEAL WHICH ALLOWS FOR CONTINUOUS DRY RUNNING OF THE PUMP WITH NO DAMAGE TO PUMPING COMPONENTS.
3. PUMP SHALL BE CAPABLE OF HANDLING 1.5 INCH DIAMETER SOLIDS.
4. PUMP SYSTEM SHALL BE MOUNTED ON AN ATV TRAILER. TRAILER TO BE DESIGNED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.
5. PUMP/TRAILER SHALL HAVE AN INTEGRAL MOUNTED FUEL TANK WITH MINIMUM 20 GALLON CAPACITY.
6. PUMP SHALL BE CAPABLE OF DELIVERING 150 GPM @ 25' TDH, (10 FT SUCTION LIFT, 15 FT LINE LOSSES) WHILE OPERATING AT NORMAL RPM.
7. PUMP WILL HAVE A 15' 3" SUCTION HOSE AND 6' 3" DISCHARGE HOSE WITH FEMALE CAM LOCK FITTINGS.

VILLAGE SAFE WATER

CRW ENGINEERING GROUP, LLC
3300 ARCTIC BLVD. SUITE 203
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
FAX: (907) 561-2273

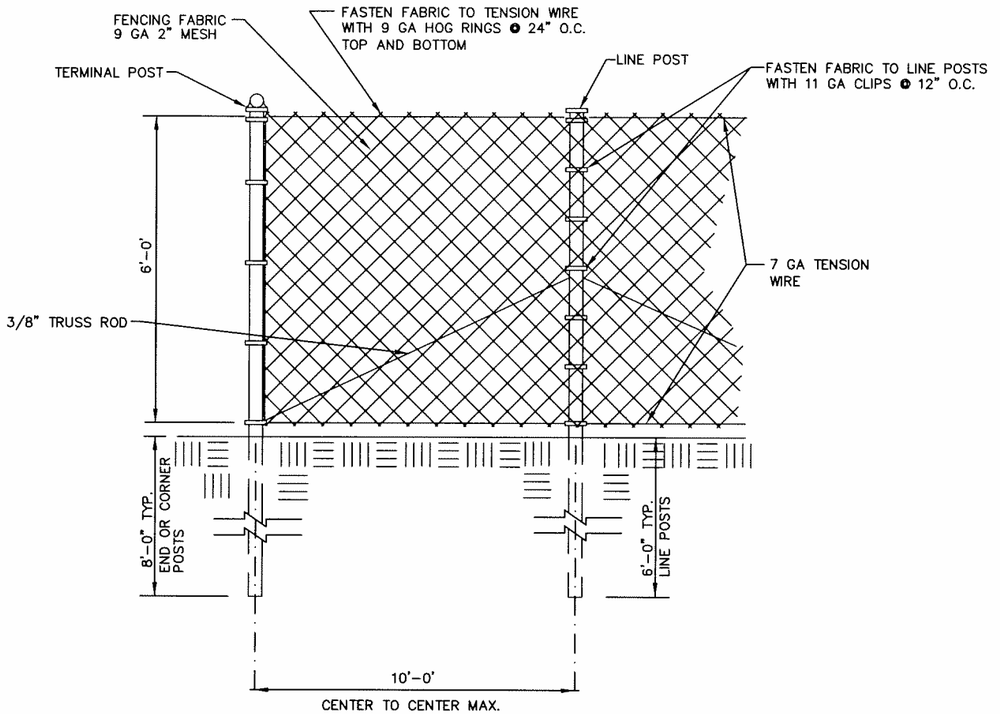
NATIVE VILLAGE OF BEAVER
WASTEWATER LAGOON CONSTRUCTION
SECTIONS AND DETAILS

NO.	REVISION	BY	DATE
	35% SUBMITTAL	DSY	3/04
	ADEC APPROVAL SUBMITTAL	DSY	5/04
	ISSUED FOR CONSTRUCTION	DSY	6/04
1	LAGOON LAYOUT REVISION	DSY	5/05

Project No. 9966
Date JUNE 2004
Designed SMB
Drawn SMB
Approved DY

Sheet No. C2

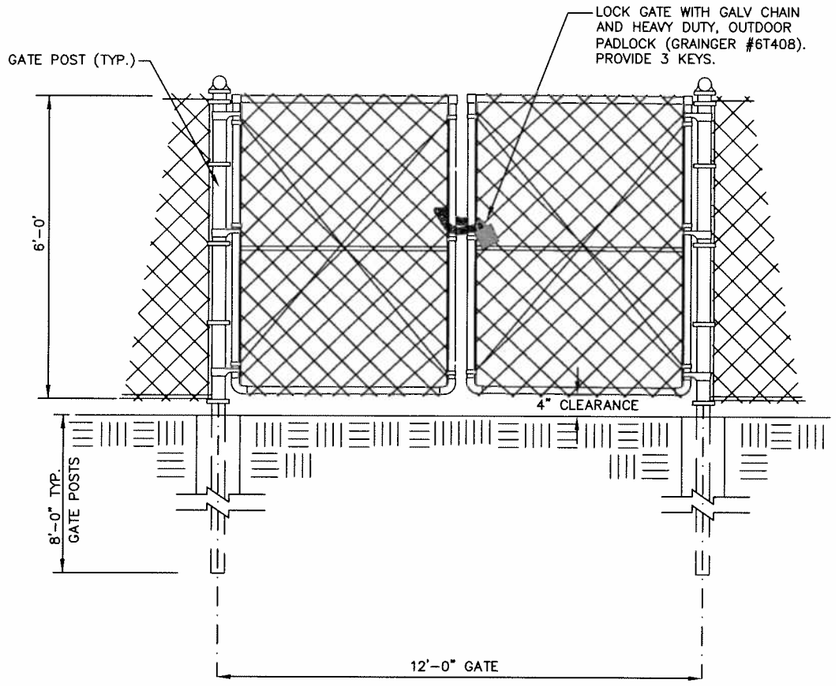
File: 9966lagoondesign.dwg



1/C3 FENCE DETAIL
NTS

NOTES:

1. WRAP BURIED PORTION OF ALL POSTS W/ 3 WRAPS OF GREASED 10 MIL VISQUEEN PRIOR TO BACKFILLING WITH NATIVE SILTS.



2/C3 GATE DETAIL
NTS

VILLAGE SAFE WATER

STATE OF ALASKA — 49TH — DAVID S. YOSHIHARA — REGISTERED PROFESSIONAL ENGINEER

CRW ENGINEERING GROUP, LLC
3900 ARCTIC BLVD. SUITE 203
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
FAX: (907) 561-2273

VILLAGE OF BEAVER
WASTEWATER LAGOON CONSTRUCTION

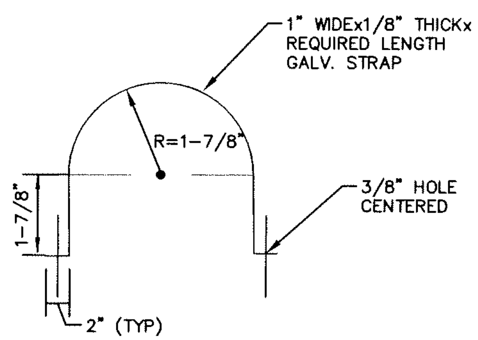
FENCE DETAILS

NO.	REVISION	BY	DATE
	35% SUBMITTAL	DSY	3/04
	ADEC APPROVAL SUBMITTAL	DSY	5/04
	ISSUED FOR CONSTRUCTION	DSY	6/04

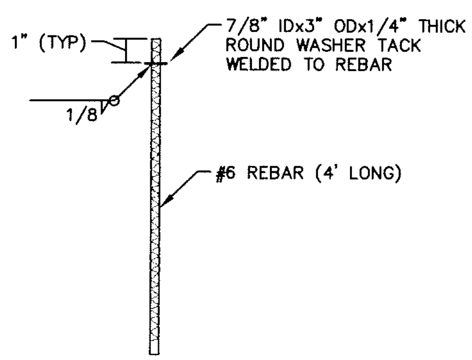
Project No. 9966
Date JUNE 2004
Designed SMB
Drawn SMB
Approved DY

Sheet No. C3

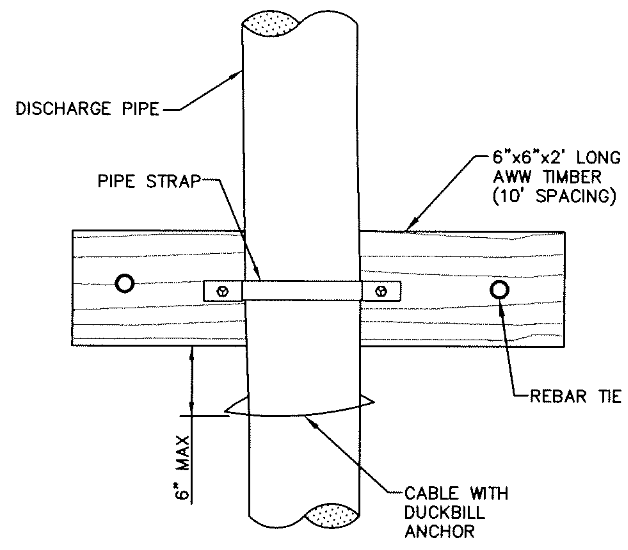
File: 9966fence.dwg



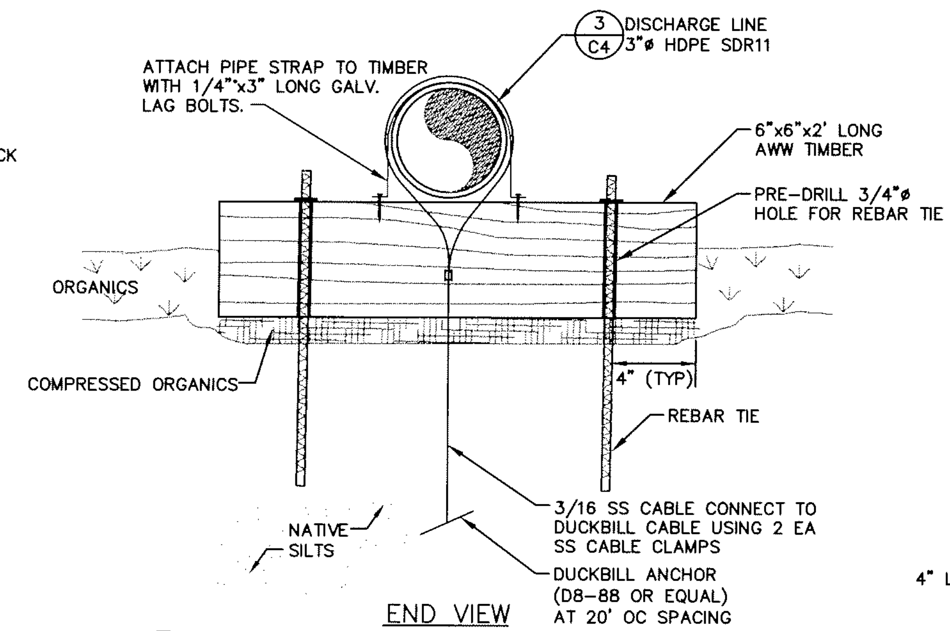
PIPESTRAP DETAIL



REBAR TIE DETAIL



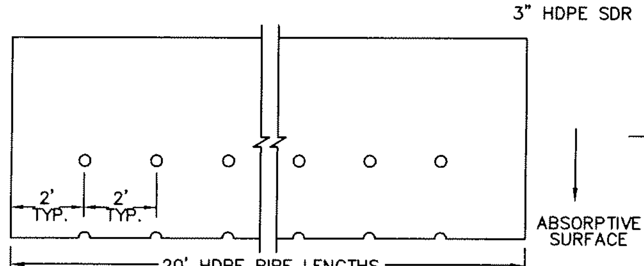
PLAN VIEW

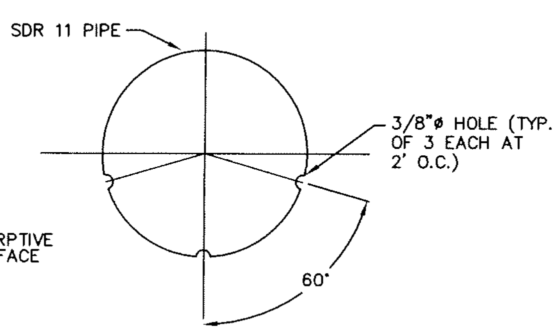


END VIEW

2 C4 SLEEPER SUPPORT DETAIL

NTS





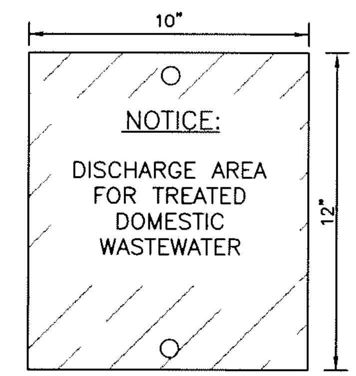
3 C4 DISCHARGE LINE DRILLING DETAIL

NTS

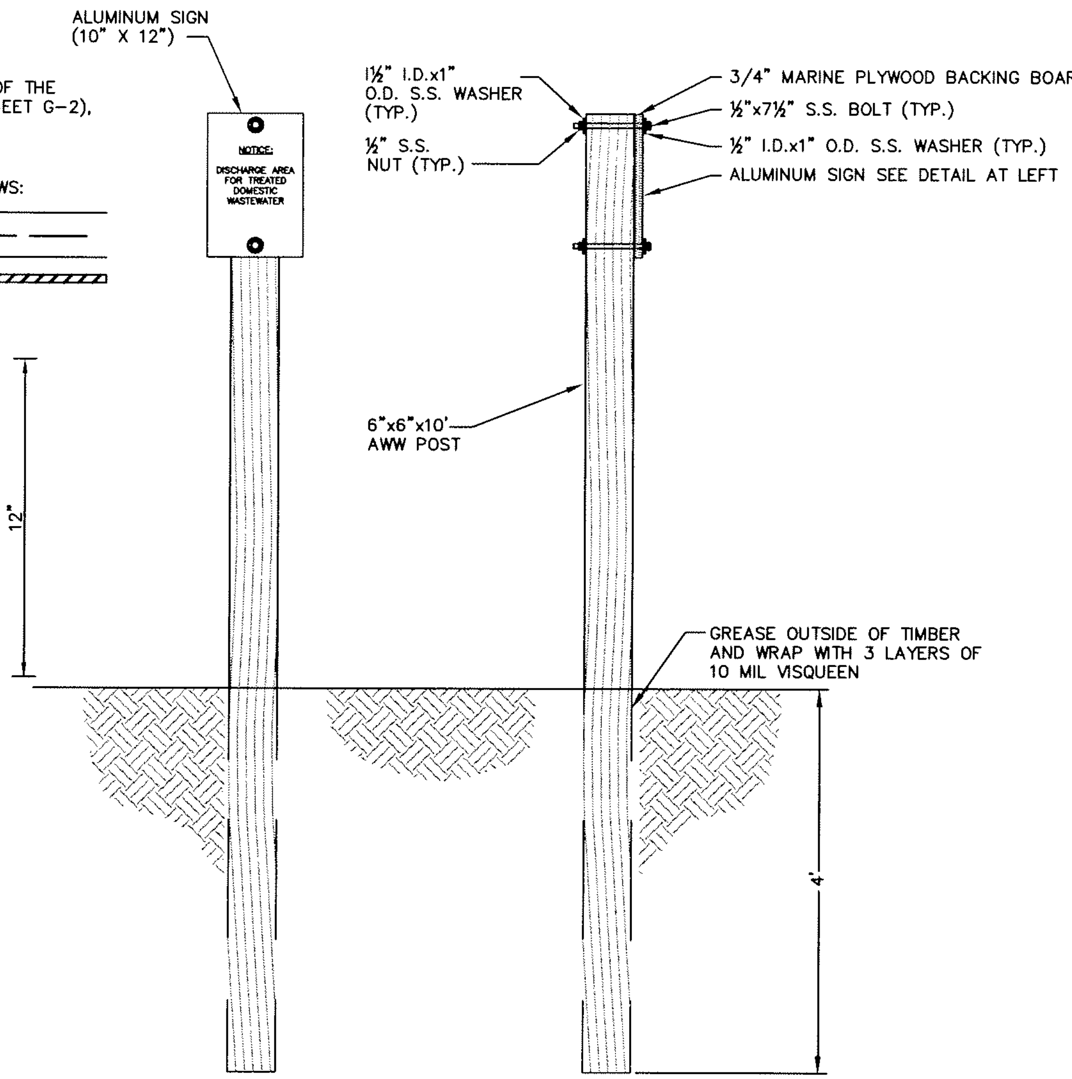
NOTE: DISCHARGE LINE IN CONTACT WITH DIKE SHALL NOT BE PERFORATED

SIGN NOTES:

1. TOTAL OF 4 SIGNS (1 AT EACH CORNER OF THE LAND TREATMENT AREA AS SHOWN ON SHEET G-2), MARKED AS SHOWN BELOW.
2. SIGNS SHALL BE CONSTRUCTED AS FOLLOWS:
   - CLEAR, UV RESISTANT TOP FILM
   - BLACK BLOCK LETTERS
   - WHITE REFLECTIVE BACKING
   - ALUMINUM SHEETING

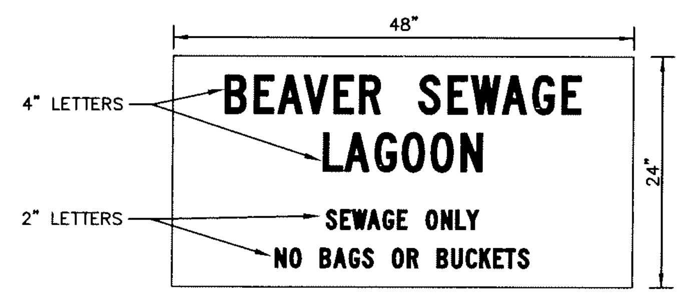


SIGN DETAIL



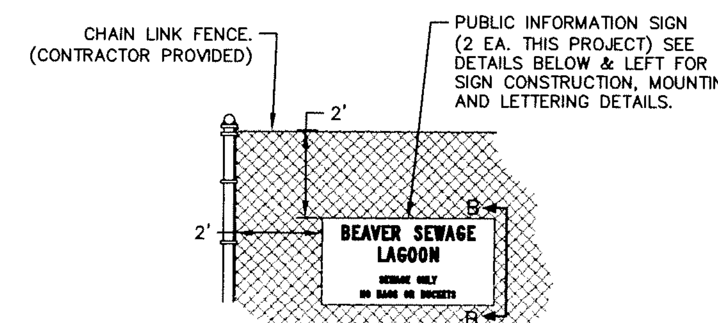
1 C4 SIGN POST DETAIL

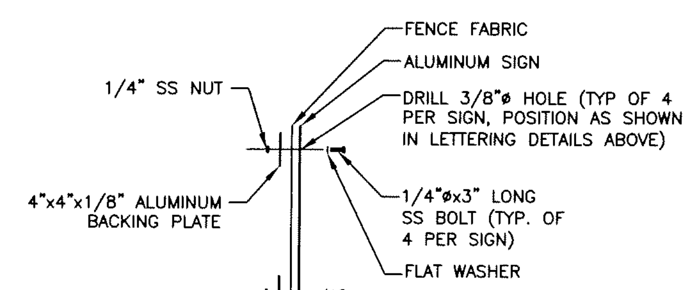
NTS



SIGN NOTES:

1. FACILITY SIGN TO BE MOUNTED AT ENTRY GATE TO LAGOON DUMP PLATFORM. SEE SHEET C-1
2. SIGNS SHALL BE CONSTRUCTED AS FOLLOWS:
   - CLEAR, UV RESISTANT TOP FILM
   - BLACK BLOCK LETTERS
   - WHITE REFLECTIVE BACKING
   - ALUMINUM SHEETING





FENCE MOUNTING DETAILS SECTION B-B

4 C4 FACILITY SIGN

NTS

VILLAGE SAFE WATER

CRW ENGINEERING GROUP, LLC
3900 ARCTIC BLVD. SUITE 203
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
FAX: (907) 561-2273

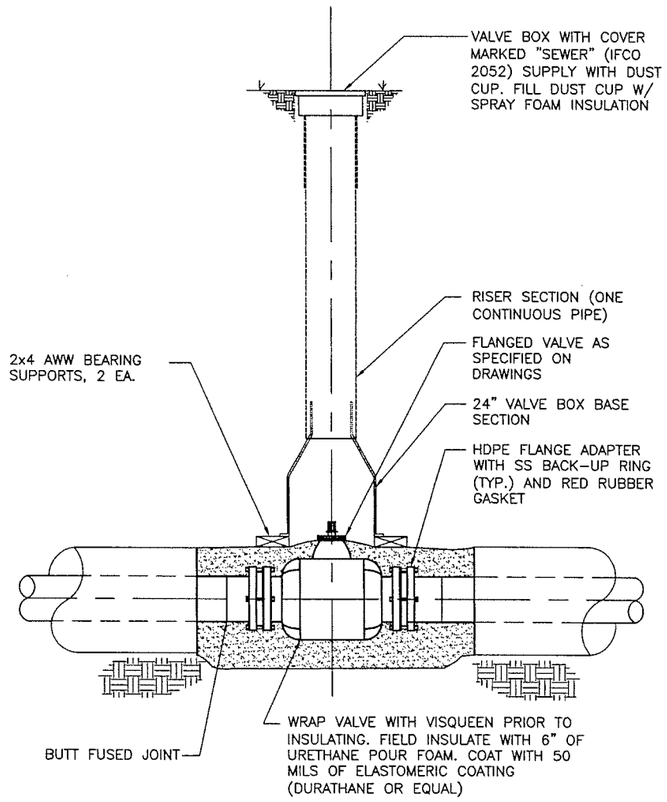
VILLAGE OF BEAVER
WASTEWATER LAGOON CONSTRUCTION
DISCHARGE LINE DETAILS

NO.	REVISION	BY	DATE
	35% SUBMITTAL	DSY	3/04
	ADEC APPROVAL SUBMITTAL	DSY	5/04
	ISSUED FOR CONSTRUCTION	DSY	6/04

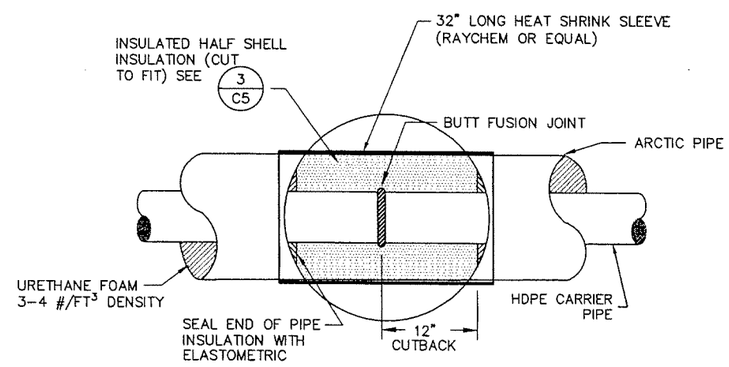
Project No. 9966
Date JUNE 2004
Designed SMB
Drawn SMB
Approved DY

Sheet No. C4

File: 9966discharge.dwg



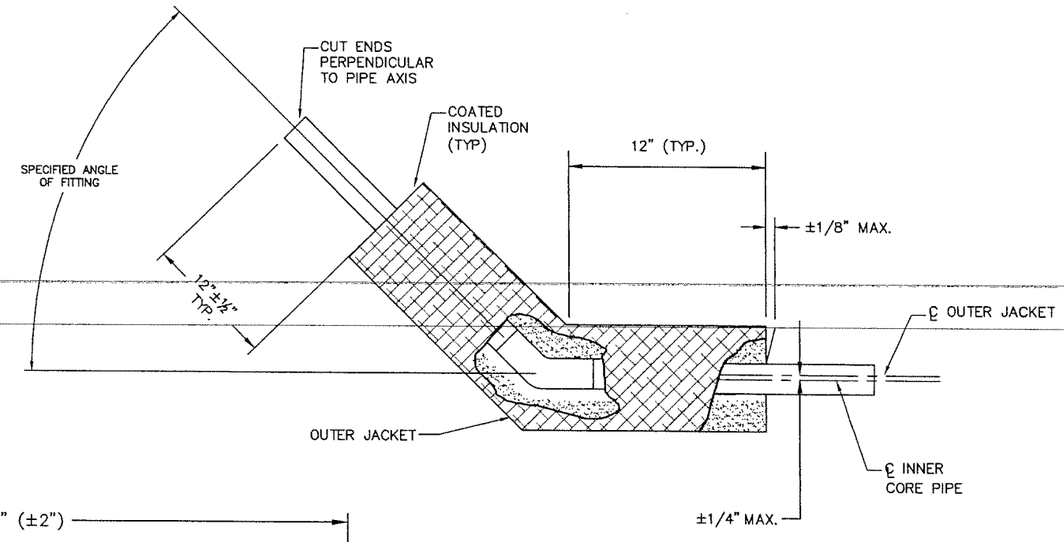
1/C5 VALVE INSTALLATION DETAIL
NTS



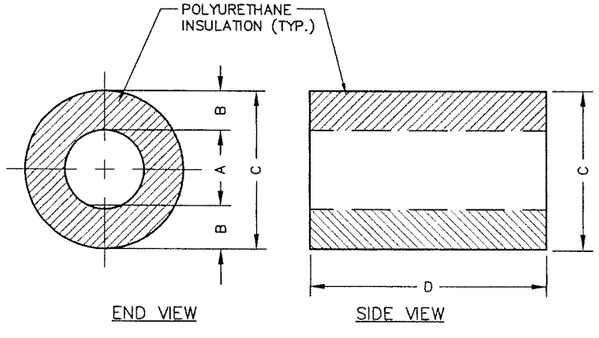
2/C5 PRE-INSULATED BUTT FUSION JOINT
NTS

NOTE:

SEE PROJECT MANUAL SPECIFICATIONS FOR FURTHER PIPE FABRICATION DETAILS.

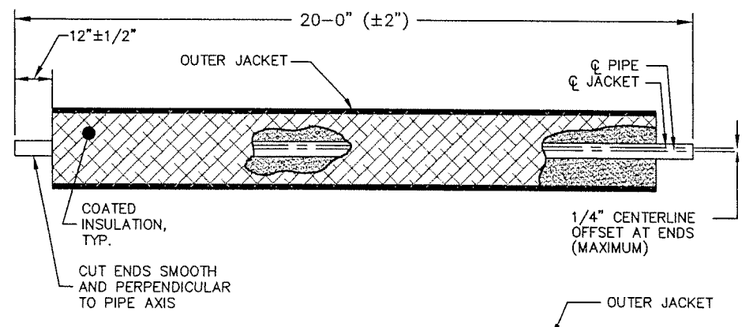


5/C5 ARCTIC PIPE BEND
NTS



PIPELINE DESCRIPTION	NOMINAL CARRIER PIPE ø	A	B	C	D
LAGOON DIKE	8"	8-3/4"	3-1/8"	15-7/8"	23"

3/C5 INSULATION HALF SHELL DETAIL
NTS



NOMINAL SIZE	CORE PIPE O.D.	OUTER JACKET O.D.
8"	8-5/8"	16"

4/C5 ARCTIC PIPE DETAIL
NTS

VILLAGE SAFE WATER

CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD., SUITE 203
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
FAX: (907) 561-2273

VILLAGE OF BEAVER
WASTEWATER LAGOON
CONSTRUCTION

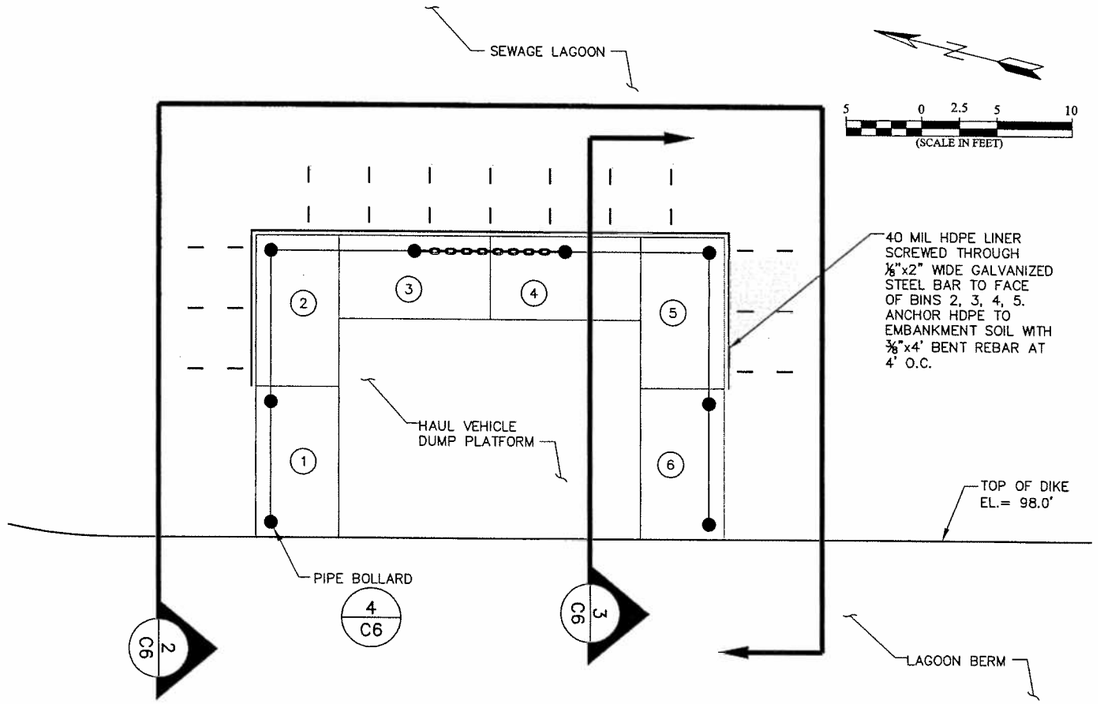
PIPING AND VALVE DETAILS

NO.	REVISION	BY	DATE
	35% SUBMITTAL	DSY	3/04
	ADEC APPROVAL SUBMITTAL	DSY	5/04
	ISSUED FOR CONSTRUCTION	DSY	6/04

Project No. 9966
Date JUNE 2004
Designed SMB
Drawn SMB
Approved DY

Sheet No. C5

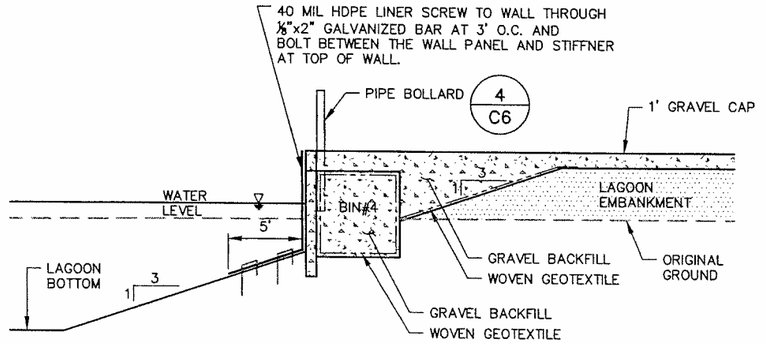
File: 9966piping.dwg



1 C6 BINWALL PLAN

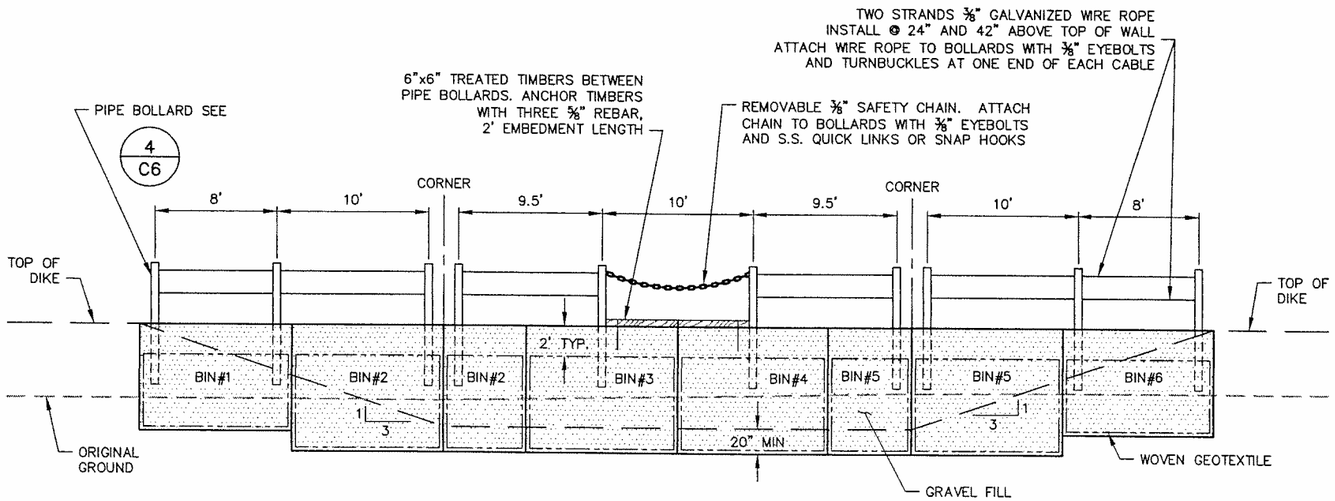
AS SHOWN

BIN WALL SCHEDULE			
BIN NO.	DESIGN TYPE	HEIGHT	WIDTH
1	A	7.00'	5.5'
2	A	8.33'	5.5'
3	A	8.33'	5.5'
4	A	8.33'	5.5'
5	A	8.33'	5.5'
6	A	7.00'	5.5'



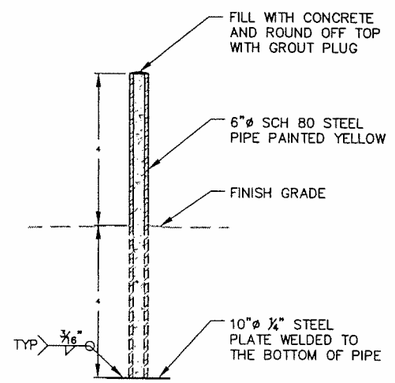
3 C6 BINWALL TYPICAL SECTION

NOT TO SCALE



2 C6 BINWALL TYPICAL SECTION

AS SHOWN



4 C6 PIPE BOLLARD DETAIL

NOT TO SCALE

VILLAGE SAFE WATER

STATE OF ALASKA 4921 REGISTERED PROFESSIONAL ENGINEER DONALD S. YOUNG CE 5123 6-22-04

CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD. SUITE 203
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
FAX: (907) 561-2273

VILLAGE OF BEAVER
WASTEWATER LAGOON CONSTRUCTION

BIN WALL DETAILS

NO.	REVISION	BY	DATE
	35% SUBMITTAL	DSY	3/04
	ADEC APPROVAL SUBMITTAL	DSY	5/04
	ISSUED FOR CONSTRUCTION	DSY	6/04

Project No. 9966
Date JUNE 2004
Designed SMB
Drawn SMB
Approved DY

Sheet No. C6

File: 9966binwall.dwg