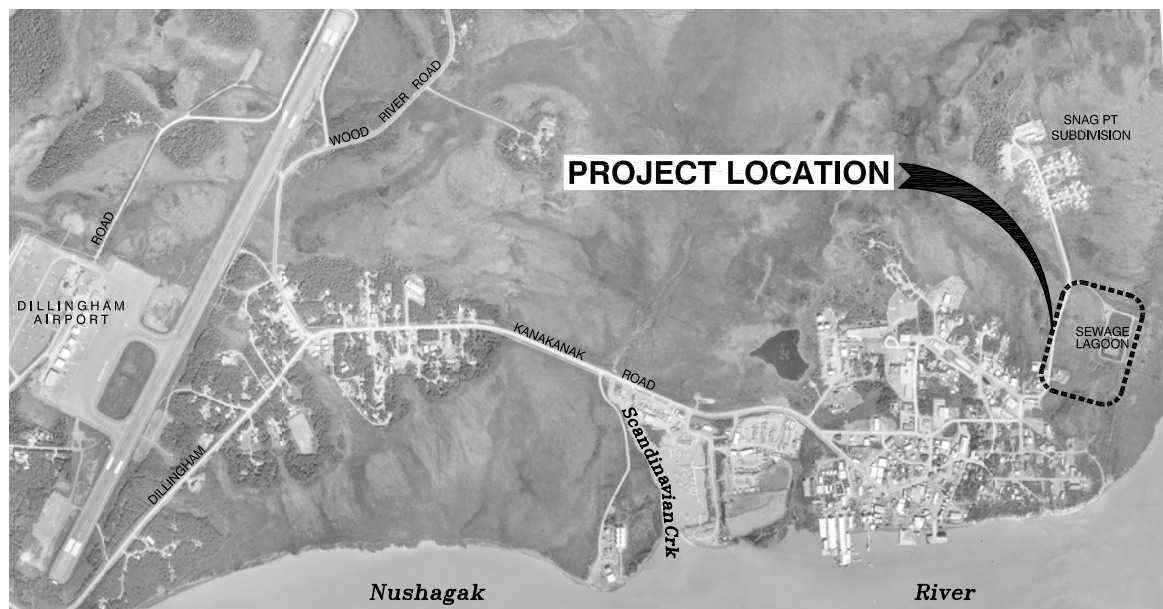




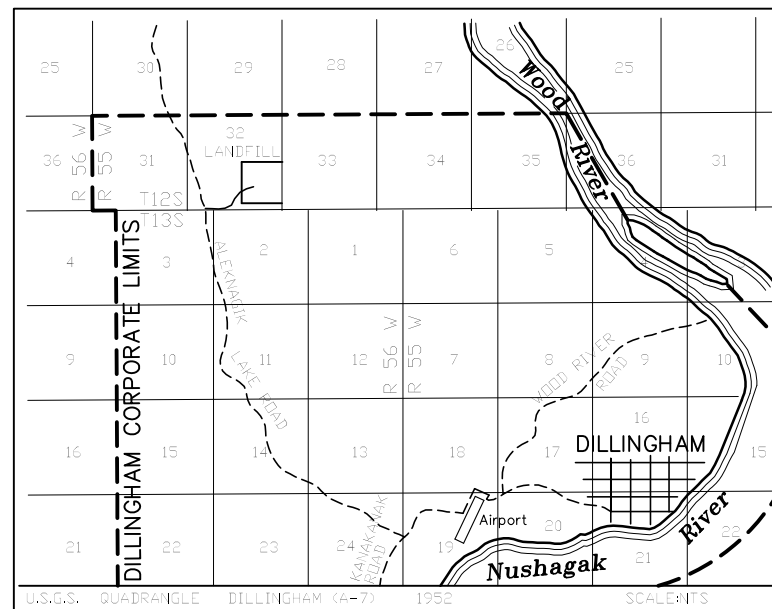
AERATED LAGOON FACILITY IMPROVEMENTS DILLINGHAM, ALASKA

ISSUED FOR CONSTRUCTION (100% SUBMITTAL)
APRIL 2019

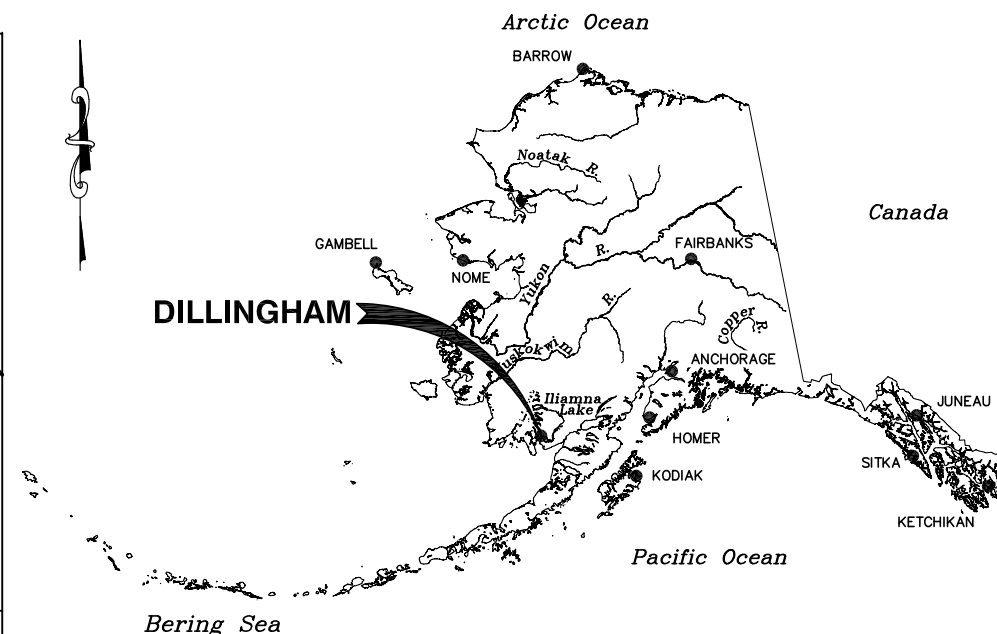
SHEET INDEX	
SHEET NO.	TITLE
G1.0	TITLE SHEET, LOCATION AND VICINITY MAPS, AND SHEET INDEX
G1.1	LEGEND, NOTES, ABBREVIATIONS, AND DESIGN CRITERIA
C1.0	EXISTING CONDITIONS – SITE PLAN
C1.1	EXISTING CONDITIONS – LAGOON PLAN
C2.0	DEMOLITION – SITE PLAN
C3.0	LAGOON IMPROVEMENTS – SITE PLAN
C3.1	LAGOON IMPROVEMENTS – AERATION SYSTEM LAYOUT PLAN AND SECTION
C3.2	LAGOON IMPROVEMENTS – AERATION SYSTEM DETAILS
C3.3	LAGOON IMPROVEMENTS – BAFFLE DETAILS
C4.0	LAGOON IMPROVEMENTS – AERATION HEADER PLAN AND SECTION
C5.0	PRE-TREATMENT POND – SITE PLAN
C5.1	PRE-TREATMENT POND – PLAN AND SECTION
C5.2	PRE-TREATMENT POND – INLET DETAILS
C5.3	PRE-TREATMENT POND – OUTLET AND DISCHARGE LINE DETAILS
C6.0	FENCE DETAILS
P1.0	BLOWER BUILDING – VALVE REPLACEMENT DETAILS



LOCATION MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE



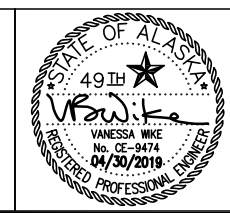
ALASKA MAP
NOT TO SCALE

User: JWANDER Apr 30, 2019 9:35am
Drawing: K:\JOBS\32190033 DLG LAGOON\ACAD-DESIGN\CIVIL\32190033_G1.0-1.1_TITLESHEETS.DWG - Layout: G1.0
Xrefs: XREF_32190034_TITLEBLOCK.DWG XREF_32190033_TITLEBLOCK.DWG - Images: DILLINGHAM-ORTHO.JPG

REVISIONS				REVISIONS			
NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION

Project No. 32190033

Bristol
ENGINEERING SERVICES COMPANY, LLC
111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
Phone (907) 563-0013 Fax (907) 563-6713
License Number: AECC697



AERATED LAGOON FACILITY IMPROVEMENTS DILLINGHAM, ALASKA					SHEET NO.
TITLE SHEET, LOCATION AND VICINITY MAPS, AND SHEET INDEX					G1.0
SCALE: SHOWN	DESIGNED: VBW	CHECKED: IPP	DRAWN: DKH	DATE: APR 2019	SHEET 1 OF 16

User: JWANDER Apr 30, 2019 - 9:35am
 Drawing: K:\JOBS\32190033 DLG LAGOON\ACAD-DESIGN\CIVIL\32190033_G1.0-1.1_TITLESHEETS.DWG - Layout: G1.1
 Xrefs: XREF_32190034_TITLEBLOCK.DWG XREF_32190033_TITLEBLOCK.DWG - Images: DILLINGHAM-ORTHO.JPG

LEGEND

	EXISTING	PROPOSED
FENCE	-----	-----
ABANDONED FORCE MAIN	//////	
FORCE MAIN	FM	
AIR LINE	AIR	AIR
SEWER	S	S
SEPTIC DUMP LINE	DS	
WATER LINE	W	
PROPERTY LINE	---	---
COTNCOURS	-50	
LIMIT OF FILL	
GRADE BREAK		---
CLEANOUT	□ c.o.	□ c.o.
CULVERT	><	><
INLET/ OUTLET	><	><
DRAINAGE ARROW		↑
SEWER VALVE	⊗	⊗
DIFFUSER	⊙	⊙
SEWER MANHOLE	⊙	⊙

ABBREVIATIONS

~ , APROX.	APPROXIMATE
ASG	ALASKA SAND AND GRAVEL
CO	CLEANOUT
DI	DUCTILE IRON
DIA	DIAMETER
DWG	DRAWING
FT	FEET
FM	FORCE MAIN
HDPE	HIGH-DENSITY POLYETHYLENE
LF	LINEAR FEET
MAX	MAXIMUM
MDD	MAXIMUM DRY DENSITY
MG	MILLIGRAMS
MIN	MINIMUM
NTS	NOT TO SCALE
SCH	SCHEDULE
SS, SST	STAINLESS STEEL
TYP	TYPICAL
PE	POLYETHYLENE
CU	COPPER

LAGOON DESIGN CRITERIA

POPULATION			
DILLINGHAM POPULATION – SUMMER	7,000		
DILLINGHAM POPULATION – WINTER	2,250		
WASTEWATER SERVICE CONNECTIONS	235		
LAGOON			
AVERAGE WASTEWATER FLOW RATE	150,000	GALLONS PER DAY	
NUMBER OF CELL	2		
AVERAGE LAGOON AREA (PER CELL)	1.5	ACRES	
MINIMUM FREEBOARD DEPTH	2	FEET	
LAGOON ACTIVE DEPTH	18	FEET	
LAGOON VOLUME (TOTAL)	9,000,000	GALLONS	
AVERAGE RESIDENT TIME	60	DAYS	
INFLUENT AVERAGE			
-BIOCHEMICAL OXYGEN DEMAND (BOD)	150	MG/L	
INFLUENT AVERAGE			
-TOTAL SUSPENDED SOLIDS (TSS)	16	MG/L	
AVERAGE BOD LOADING	125	POUNDS/ACRE DAY	
HAULED WASTEWATER*			
SUMMER CITY HAUL	2,000	GALLONS PER MONTH	
SUMMER PRIVATE HAUL	250,000	GALLONS PER MONTH	
TOTAL SUMMER WASTEWATER HAUL	252,000	GALLONS PER MONTH	
WINTER PRIVATE HAUL	10,000	GALLONS PER MONTH	
*7 NON-FROZEN MONTHS, 5 FROZEN MONTHS ASSUMED			
PERMIT			
STATE OF ALASKA			
-GENERAL WASTEWATER PERMIT	AKG573004		
DATE ISSUE	09/01/2018		
DATE EXPIRES	08/31/2023		

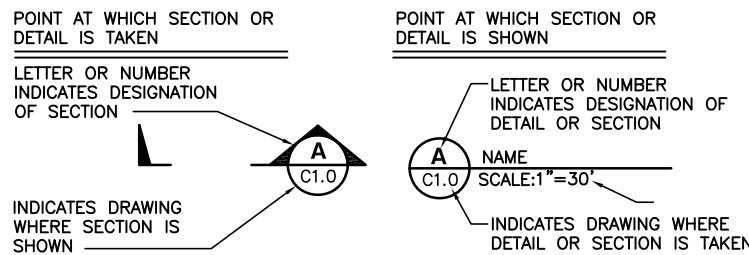
NOTES:

- MULTIPLE SURVEY DATA SOURCES USED FOR PROJECT. ALL ELEVATION DATA IS BASED ON BEST AVAILABLE DATA. FIELD VERIFY BEFORE CONSTRUCTION.
- THE LOCATION OF UTILITIES IS ESTIMATED BASED ON AVAILABLE DATA. RECORD DRAWINGS FOR THE 2018 SEWER MAIN RECONSTRUCTION AND WATER METER MANHOLE WERE NOT AVAILABLE. ALL UTILITIES MUST BE FIELD VERIFIED PRIOR TO CONSTRUCTION.

SUMMARY AND OPERATIONS:

- THE DILLINGHAM LAGOON HAS NOT CONSISTENTLY MET THE PERMIT DISCHARGE REQUIREMENTS. THE CURRENT AERATION SYSTEMS HAVE DETERIORATED DUE TO AGE AND DAMAGE. THE CURRENT BAFFLE SYSTEMS WERE ALIGNED WITH THE ORIGINAL AERATION EQUIPMENT, AND ARE NO LONGER CONNECTED ALONG THE BANK EDGES, ALLOWING SHORT CIRCUITING. A NEW AERATION SYSTEM AND ACCOMPANYING BAFFLE SYSTEM DESIGN IS PROVIDED.
- THE NEW AERATION SYSTEM WILL INCLUDE AERATION IN THE SECOND LAGOON CELL, WITH A PORTION OF THE SECOND CELL RESERVED FOR SETTLING PRIOR TO DISCHARGE. THE EXISTING VALVES WITHIN THE BLOWER BUILDING THAT CONTROL AIR FLOW ARE NO LONGER OPERABLE AND MUST BE REPLACED. A NEW AIR HEADER WILL BE INSTALLED FROM THE BLOWER BUILDING TO THE NEW AERATION MANIFOLDS ALONG THE BANK.
- A WASTEWATER HAUL DUMP STATION WAS CONSTRUCTED ALONG THE SOUTH EAST EDGE OF THE LAGOON. THIS REQUIRES A LOADED PUMP TRUCK TO NAVIGATE A DIRT ROAD, DURING POOR CONDITIONS (WINTER SNOW AND ICE, AND BREAKUP). THE CHEMICAL INJECTION SYSTEM IS NOT OPERABLE DURING WINTER MONTHS. THE HAULED WASTEWATER CONSISTS SIGNIFICANTLY OF HOLDING TANK WASTEWATER, WITH A LESSER AMOUNT OF SEPTAGE.
- A NEW PRETREATMENT POND WILL PROVIDE A SAFER, SECURE DUMPING POINT. THE POND IS INTENDED TO PROVIDE A FULL WINTER OF STORAGE. AT THE END OF FALL, THE STOP LOGS IN THE EFFLUENT CONTROL MANHOLE, WILL BE PULLED (ONE STOP LOG PER DAY, OR APPROXIMATELY 17,000 GALLONS PER DAY) TO ALLOW THE FULL DISCHARGE OF THE PRE-TREATMENT POND. THE STOP LOGS WILL THEN BE REINSERTED TO PROVIDE FOR WINTER STORAGE OF WASTEWATER HAUL DUMPING. IN THE SPRING, SUFFICIENT STORAGE WILL BE AVAILABLE TO ALLOW THE MELTING OF THE SHALLOW PRE-TREATMENT POND. THE STOP LOGS WILL MAINTAIN A POND DEPTH OF 6.0 FEET. CONTINUOUS DISCHARGE FROM THE POND WILL OCCUR DURING THE NON-WINTER MONTHS.

SECTIONS AND DETAIL DESIGNATION



REFERENCE TO DETAILS AND SECTIONS ARE ALSO DESIGNATED BY X/A-Y, WHERE X IS A NUMBER FOR DETAILS AND A LETTER FOR SECTIONS, AND A-Y IS THE DRAWING ON WHICH THE SECTION OR DETAIL APPEARS

EFFLUENT WASTEWATER PERMIT LIMITS*

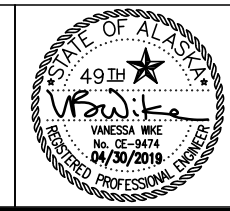
*PARTIAL LISTING OF KEY CRITERIA

MAXIMUM FLOW	273,000	GALLONS PER DAY
PH	6-9	
MINIMUM DISSOLVED OXYGEN (DO)	2	MG/L
MAXIMUM AVERAGE BOD (MONTHLY)	30	MG/L
MAXIMUM AVERAGE BOD (MONTHLY)	68	LBS PER DAY
MAXIMUM AVERAGE TSS (MONTHLY)	45	MG/L
MAXIMUM AVERAGE TSS (MONTHLY)	103	LBS PER DAY
MAXIMUM AVERAGE		
FECAL COLIFORM (MONTHLY)	200	FC/100 ML

REVISIONS				REVISIONS			
NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION

Project No. 32190033

Bristol
 ENGINEERING SERVICES COMPANY, LLC
 111 W. 16th Avenue, Third Floor
 Anchorage, AK 99501
 Phone (907) 563-0013 Fax (907) 563-6713
 License Number: AEC697

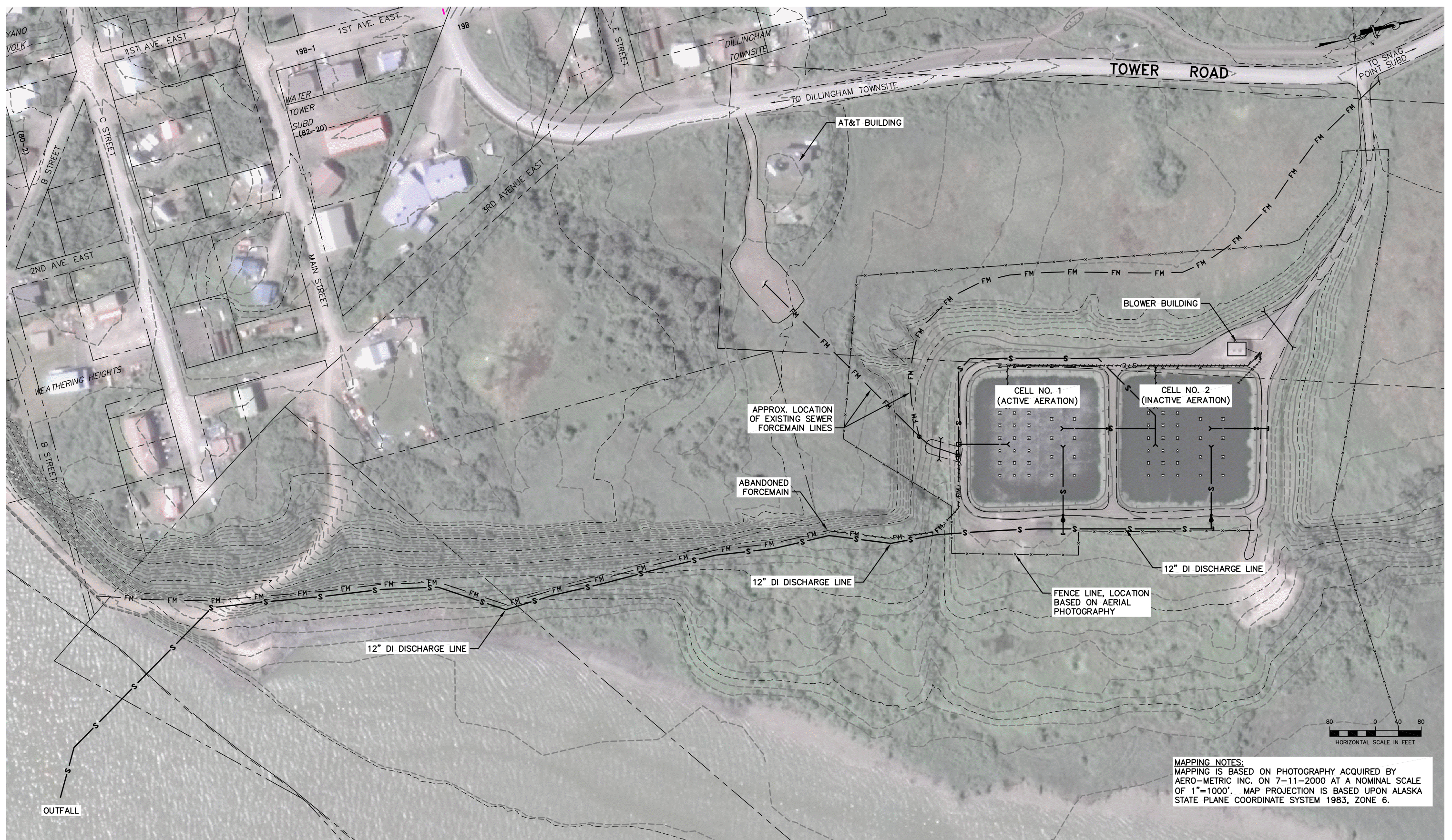


AERATED LAGOON FACILITY IMPROVEMENTS
 DILLINGHAM, ALASKA

LEGEND, NOTES, ABBREVIATIONS, AND DESIGN CRITERIA

SCALE: SHOWN DESIGNED: VBW CHECKED: IPP DRAWN: DKH DATE: APR 2019

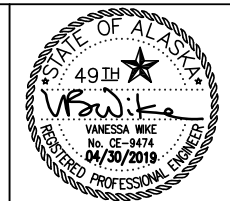
User: JWANDER Apr 30, 2019 - 9:18am
 Drawing: K:\JOBS\32190033_DLG LAGOON\ACAD-DESIGN\CIVIL\32190033_C1.0-EXISTING CONDITIONS SITE PLAN.DWG - Layout: C1.0
 Xrefs: 32190033_BASE-STL.DWG XREF_32190033_TITLEBLOCK.DWG - Images: CELLS G EARTH.PNG DILLINGHAM-ORTHO.JPG



MAPPING NOTES:
 MAPPING IS BASED ON PHOTOGRAPHY ACQUIRED BY AERO-METRIC INC. ON 7-11-2000 AT A NOMINAL SCALE OF 1"=1000'. MAP PROJECTION IS BASED UPON ALASKA STATE PLANE COORDINATE SYSTEM 1983, ZONE 6.

REVISIONS				REVISIONS			
NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION

Bristol
 ENGINEERING SERVICES COMPANY, LLC
 111 W. 16th Avenue, Third Floor
 Anchorage, AK 99501
 Phone (907) 563-0013 Fax (907) 563-6713
 License Number: AECC697



**AERATED LAGOON FACILITY IMPROVEMENTS
 DILLINGHAM, ALASKA**

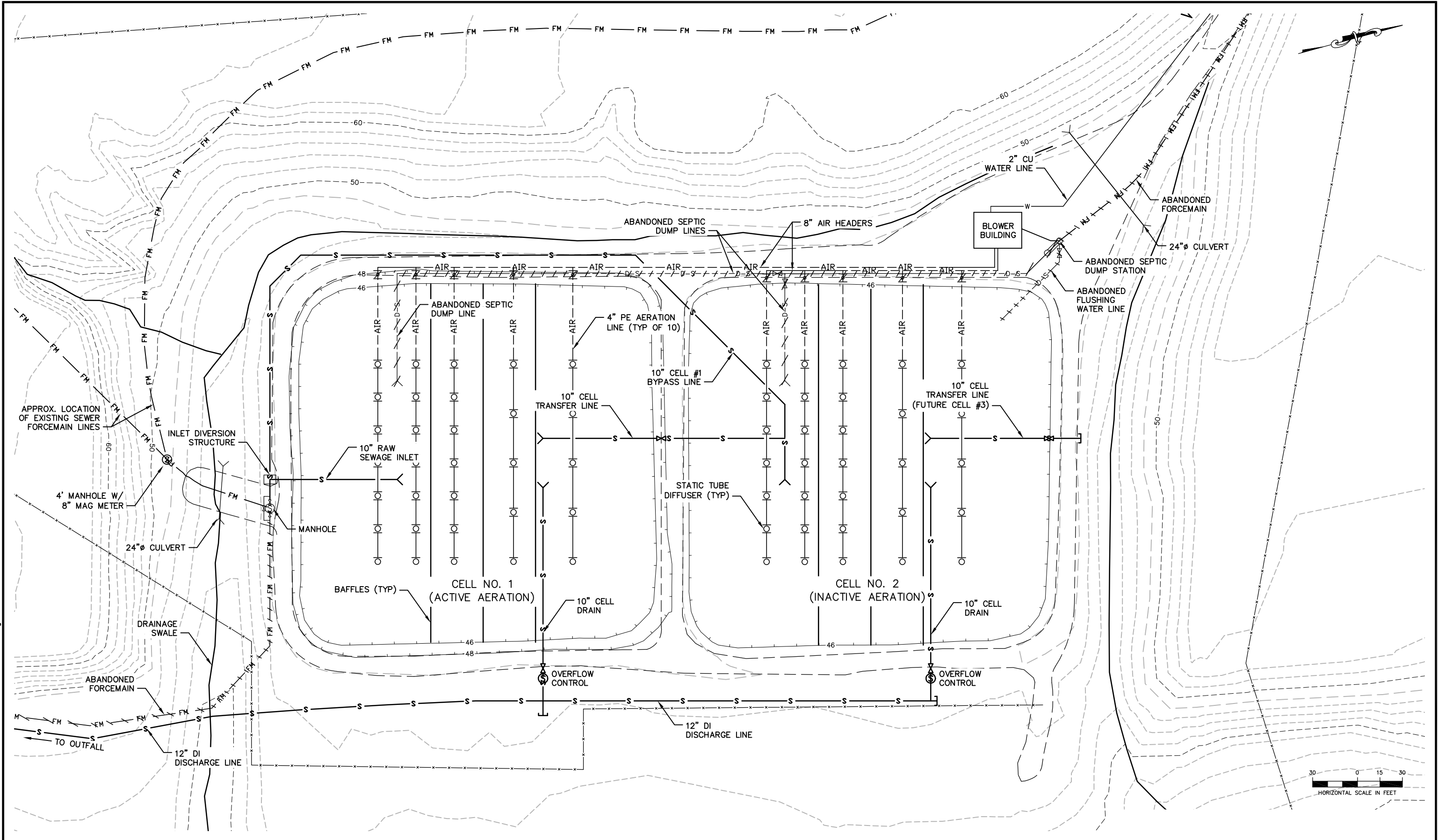
**EXISTING CONDITIONS
 SITE PLAN**

SCALE: SHOWN DESIGNED: VBW CHECKED: IPP DRAWN: DKH DATE: APR 2019

SHEET NO.
C1.0

SHEET **3** OF **16**

User: JMWANDER Apr 30, 2019 - 9:19am
 Drawing: K:\JOBS\32190033_DLG LAGOON\ACAD-DESIGN\CIVIL\32190033_C1.1_EXISTING CONDITIONS LAGOON PIPING PLAN.DWG - Layout: C1.1
 Xrefs: XREF_32190033_TITLEBLOCK.DWG 32190033_BASE-STL.DWG - Images: DILLINGHAM-ORTHO.JPG

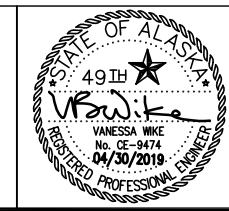


REVISIONS			
NO.	DATE	BY	DESCRIPTION

REVISIONS			
NO.	DATE	BY	DESCRIPTION

Project No. 32190033

Bristol
 ENGINEERING SERVICES COMPANY, LLC
 111 W. 16th Avenue, Third Floor
 Anchorage, AK 99501
 Phone (907) 563-0013 Fax (907) 563-6713
 License Number: AECC697



AERATED LAGOON FACILITY IMPROVEMENTS
 DILLINGHAM, ALASKA

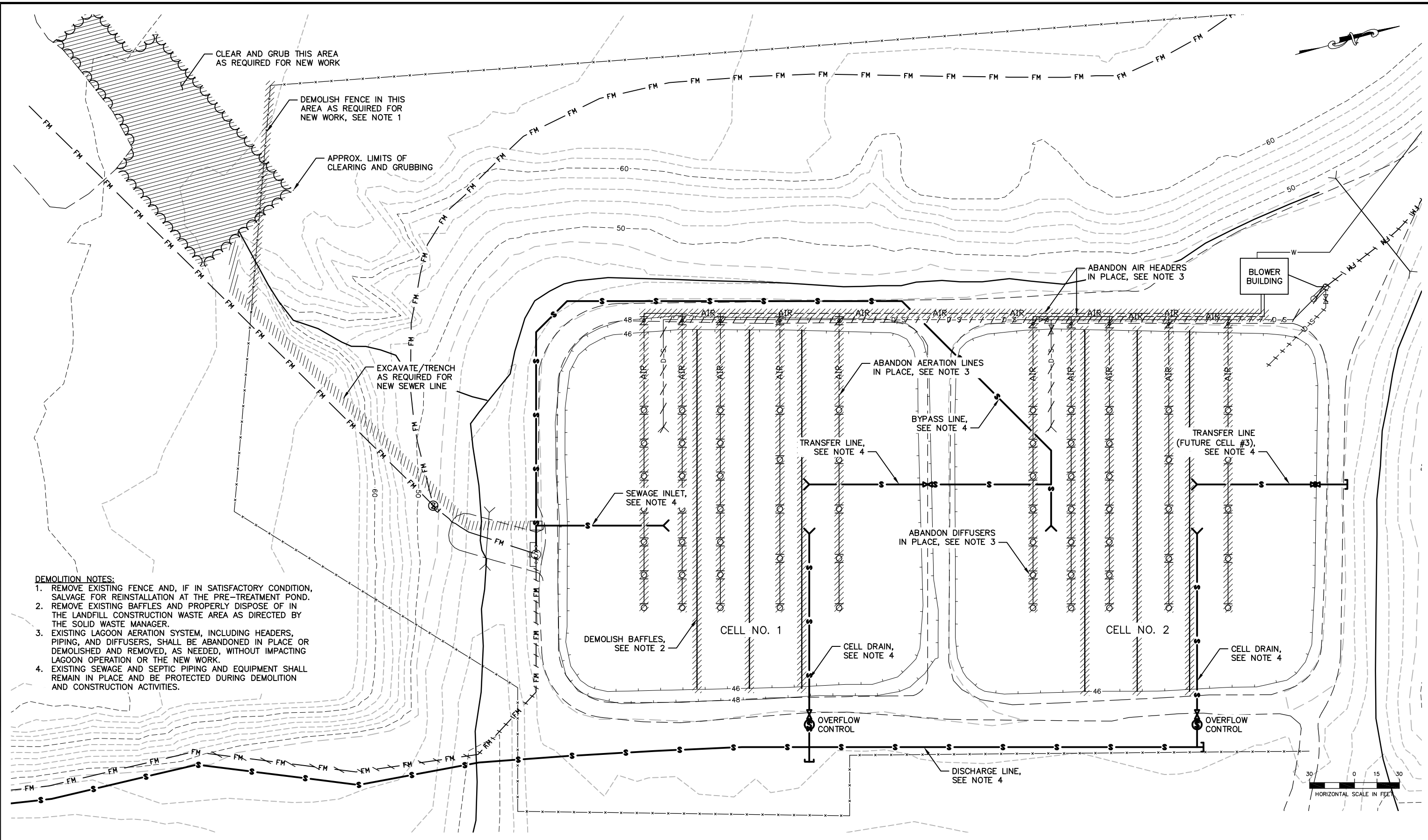
**EXISTING CONDITIONS
 LAGOON PLAN**

SCALE: SHOWN DESIGNED: VBW CHECKED: IPP DRAWN: DKH DATE: APR 2019

SHEET NO.
C1.1

SHEET 4 OF 16

User: JWANDER Apr 30, 2019 - 9:19am
 Drawing: K:\JOBS\32190033_DLG LAGOON\ACAD-DESIGN\CIVIL\32190033_C2.0_DEMOLITION SITE PLAN.DWG - Layout: C2.0
 Xrefs: XREF_32190033_TITLEBLOCK.DWG 32190033_BASE-STL.DWG - Images: DILLINGHAM-ORTHO.JPG

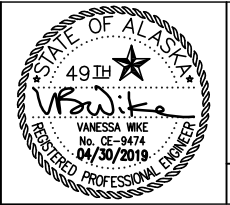


- DEMOLITION NOTES:**
1. REMOVE EXISTING FENCE AND, IF IN SATISFACTORY CONDITION, SALVAGE FOR REINSTALLATION AT THE PRE-TREATMENT POND.
 2. REMOVE EXISTING BAFFLES AND PROPERLY DISPOSE OF IN THE LANDFILL CONSTRUCTION WASTE AREA AS DIRECTED BY THE SOLID WASTE MANAGER.
 3. EXISTING LAGOON AERATION SYSTEM, INCLUDING HEADERS, PIPING, AND DIFFUSERS, SHALL BE ABANDONED IN PLACE OR DEMOLISHED AND REMOVED, AS NEEDED, WITHOUT IMPACTING LAGOON OPERATION OR THE NEW WORK.
 4. EXISTING SEWAGE AND SEPTIC PIPING AND EQUIPMENT SHALL REMAIN IN PLACE AND BE PROTECTED DURING DEMOLITION AND CONSTRUCTION ACTIVITIES.

REVISIONS				REVISIONS			
NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION

Project No. 32190033

Bristol
 ENGINEERING SERVICES COMPANY, LLC
 111 W. 16th Avenue, Third Floor
 Anchorage, AK 99501
 Phone (907) 563-0013 Fax (907) 563-6713
 License Number: AECC697



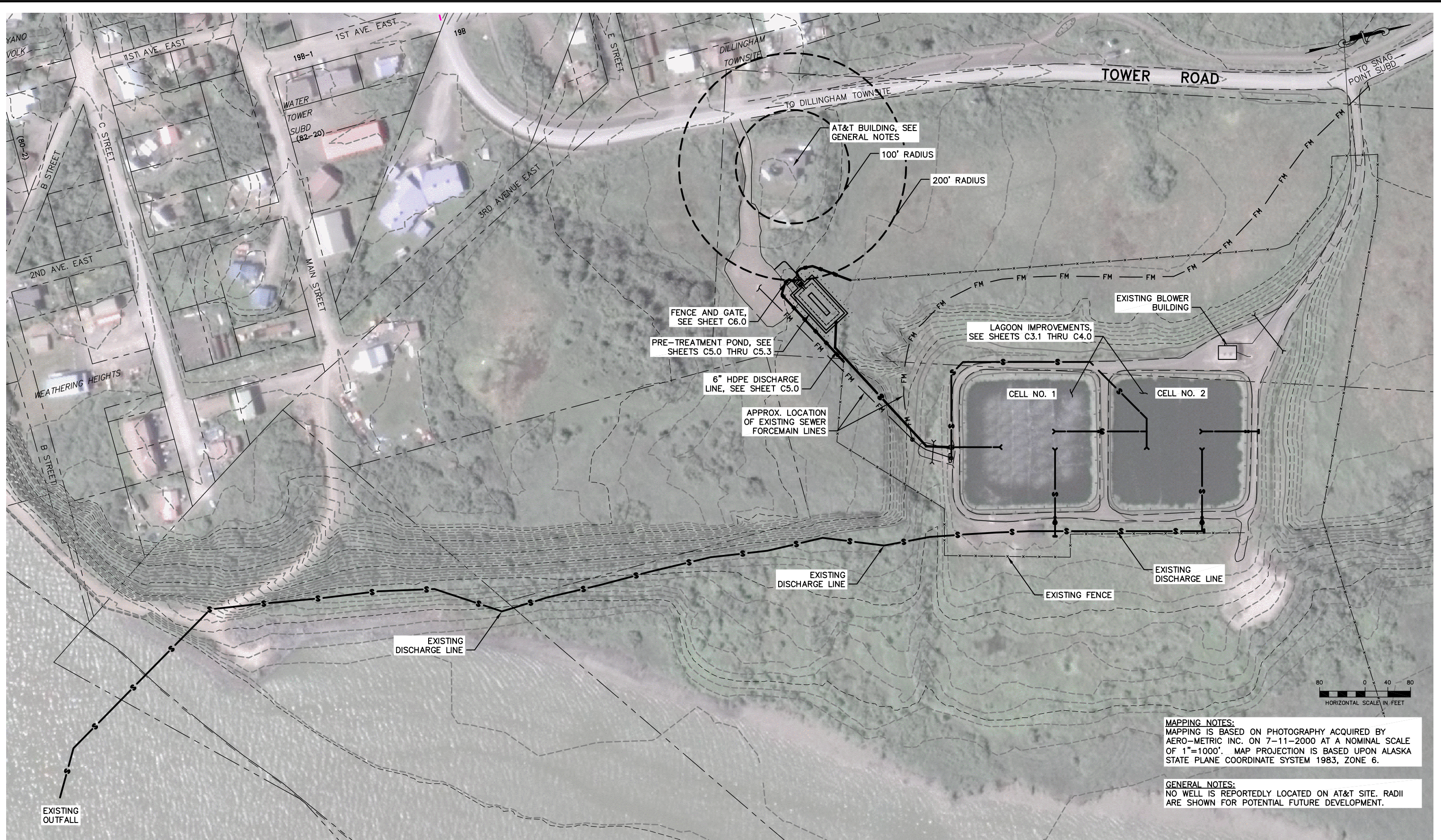
AERATED LAGOON FACILITY IMPROVEMENTS
 DILLINGHAM, ALASKA

DEMOLITION SITE PLAN

SCALE: SHOWN DESIGNED: VBW CHECKED: IPP DRAWN: DKH DATE: APR 2019

SHEET NO.	C2.0
SHEET 5 OF 16	

User: JWANDER Apr 30, 2019 - 9:32am
 Drawing: K:\JOBS\32190033_DLG LAGOON IMPROVEMENTS SITE PLAN.DWG - Layout: C3.0
 Xrefs: 32190033_BASE-STL.DWG XREF_32190033_TITLEBLOCK.DWG 32190033_SITE PLAN.DWG - Images: CELLS G EARTH.PNG DILLINGHAM-ORTHO.JPG

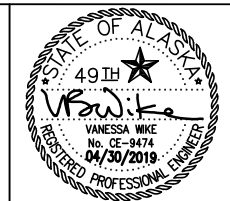


MAPPING NOTES:
 MAPPING IS BASED ON PHOTOGRAPHY ACQUIRED BY AERO-METRIC INC. ON 7-11-2000 AT A NOMINAL SCALE OF 1"=1000'. MAP PROJECTION IS BASED UPON ALASKA STATE PLANE COORDINATE SYSTEM 1983, ZONE 6.

GENERAL NOTES:
 NO WELL IS REPORTEDLY LOCATED ON AT&T SITE. RADII ARE SHOWN FOR POTENTIAL FUTURE DEVELOPMENT.

REVISIONS				REVISIONS			
NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION

Bristol
 ENGINEERING SERVICES COMPANY, LLC
 111 W. 16th Avenue, Third Floor
 Anchorage, AK 99501
 Phone (907) 563-0013 Fax (907) 563-6713
 License Number: AECC697



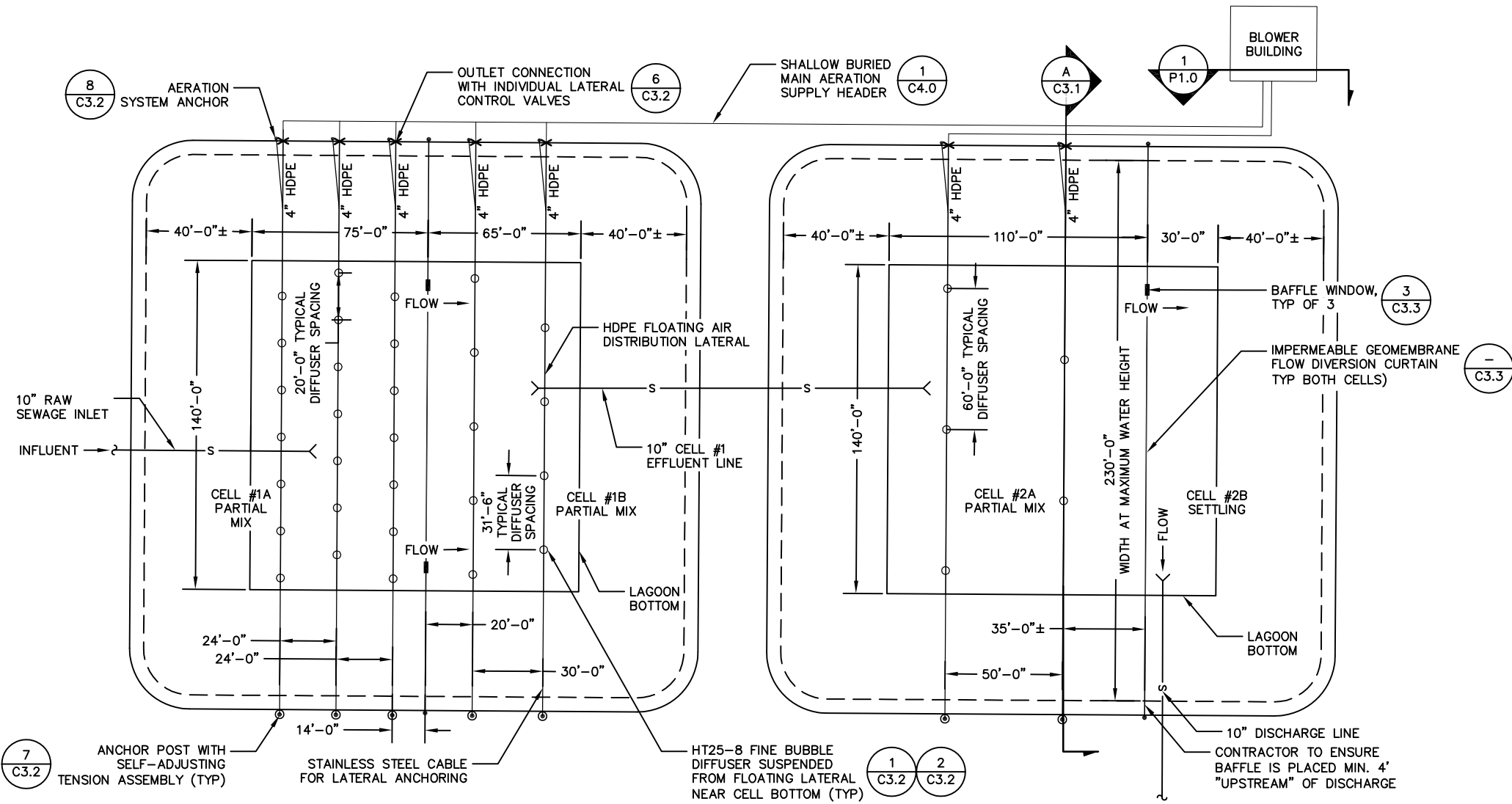
**AERATED LAGOON FACILITY IMPROVEMENTS
 DILLINGHAM, ALASKA**

**LAGOON IMPROVEMENTS
 SITE PLAN**

SCALE: SHOWN DESIGNED: VBW CHECKED: IPP DRAWN: DKH DATE: APR 2019 SHEET 6 OF 16

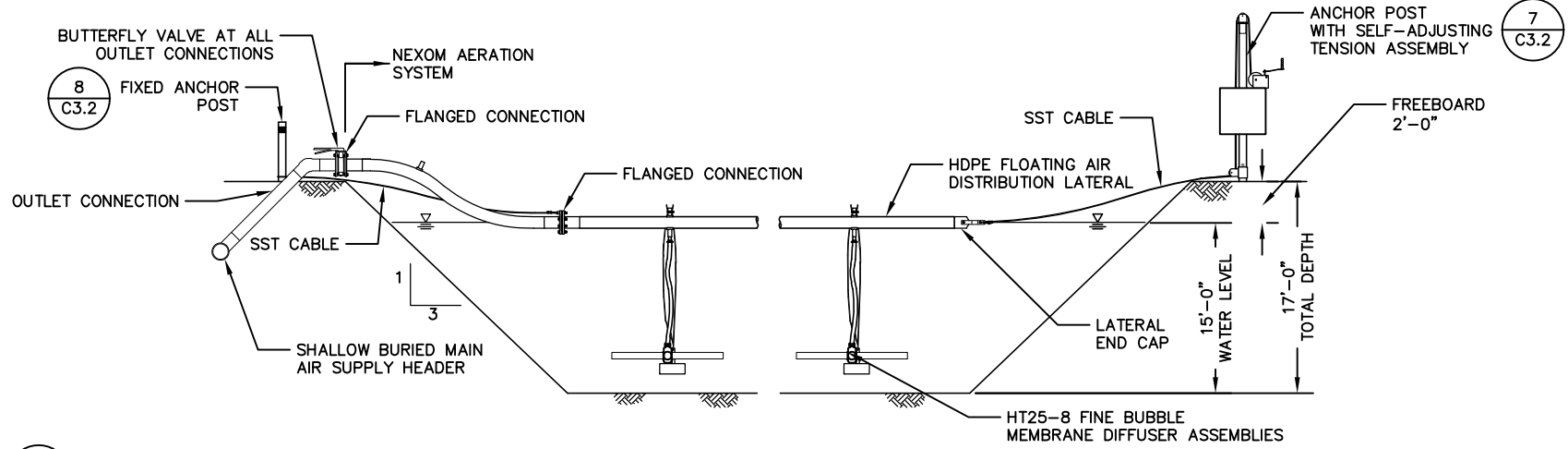
SHEET NO. **C3.0**

User: JWANDER Apr 30, 2019 - 9:19am
 Drawing: K:\JOBS\32190033_DLG LAGOON\ACAD-DESIGN\CIVIL\32190033_C3.1-3.3_LAGOON IMPROVEMENTS DETAILS.DWG - Layout: C3.1
 Xrefs: XREF_32190033_TITLEBLOCK.DWG - Images: 32190033_AIRMAN_HOLE.PNG



- NOTES:**
1. AERATION SYSTEM SHALL CONSIST OF NEXOM OPTAER COMPONENTS OR APPROVED EQUAL. ANY ALTERNATE AERATION SYSTEM MUST INCLUDE REGULATORY APPROVAL, PRIOR TO BID DATE, TO BE CONSIDERED EQUAL.
 2. LAGOON SYSTEM SHALL REMAIN IN OPERATION DURING IMPROVEMENTS CONSTRUCTION.
 3. CONTRACTOR SHALL NOT INSTALL ANCHOR POST FOR AERATION AND BAFFLE SYSTEMS WITHOUT LAYOUT APPROVAL FROM THE ONSITE ENGINEERING IN WRITING.

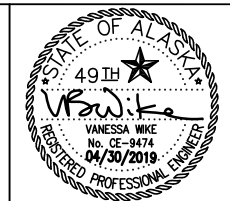
1
 C3.1 **LAGOON AERATION LAYOUT PLAN**
 SCALE: NTS



A
 C3.1 **LAGOON AERATION SECTION**
 SCALE: NTS

REVISIONS				REVISIONS			
NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION

Bristol
 ENGINEERING SERVICES COMPANY, LLC
 111 W. 16th Avenue, Third Floor
 Anchorage, AK 99501
 Phone (907) 563-0013 Fax (907) 563-6713
 License Number: AECC697



AERATED LAGOON FACILITY IMPROVEMENTS
 DILLINGHAM, ALASKA

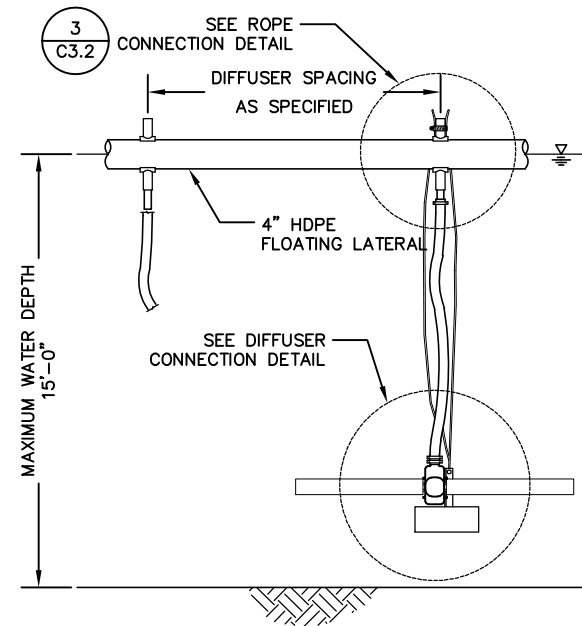
**LAGOON IMPROVEMENTS
 AERATION SYSTEM LAYOUT PLAN AND SECTION**

SCALE: SHOWN | DESIGNED: VBW | CHECKED: IPP | DRAWN: DKH | DATE: APR 2019

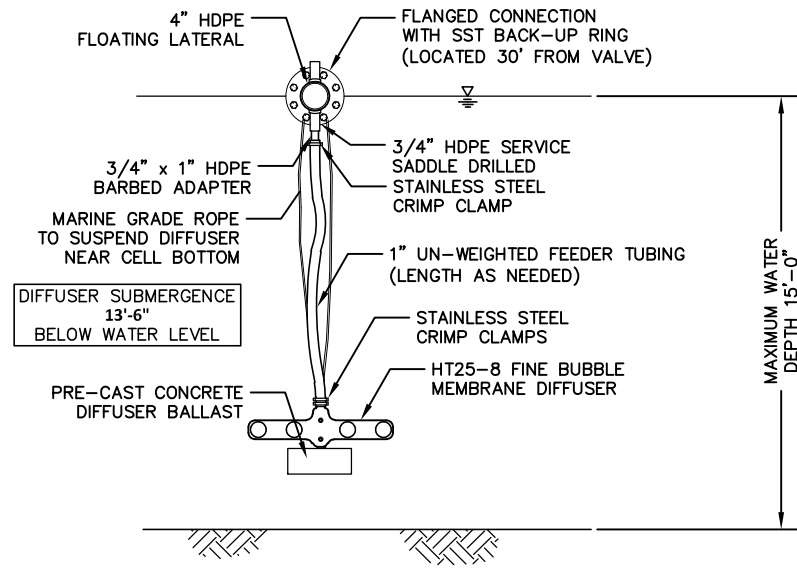
SHEET 7 OF 16

SHEET NO.
C3.1

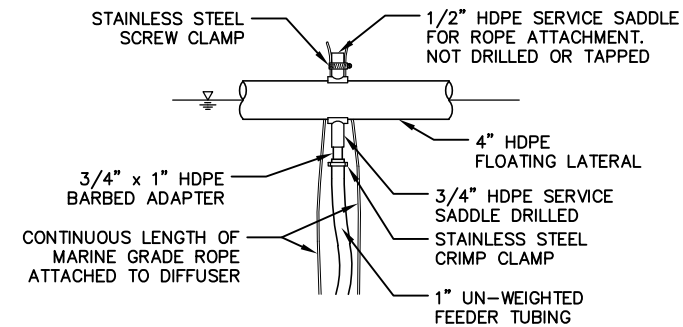
User: JWANDER Apr 30, 2019 - 9:19am
 Drawing: K:\JOBS\32190033_DLG LAGOON IMPROVEMENTS DETAILS.DWG - Layout: C3.2
 Xrefs: XREF_32190033_TITLEBLOCK.DWG - Images: 32190033_AIRMAN_HOLE.PNG



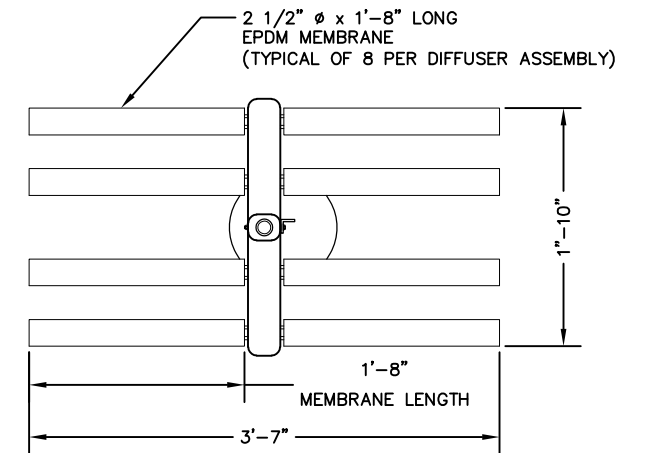
1 LATERAL DETAIL - ELEVATION
 C3.2 SCALE: NTS



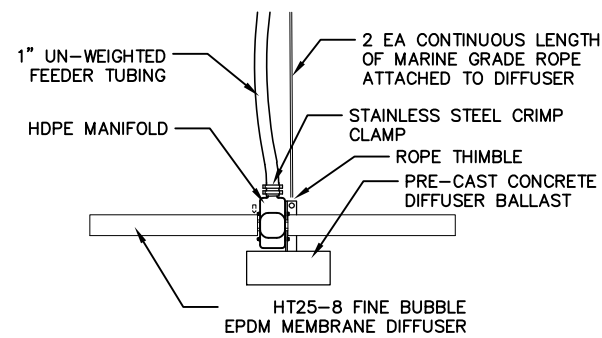
2 LATERAL DETAIL - SECTION
 C3.2 SCALE: NTS



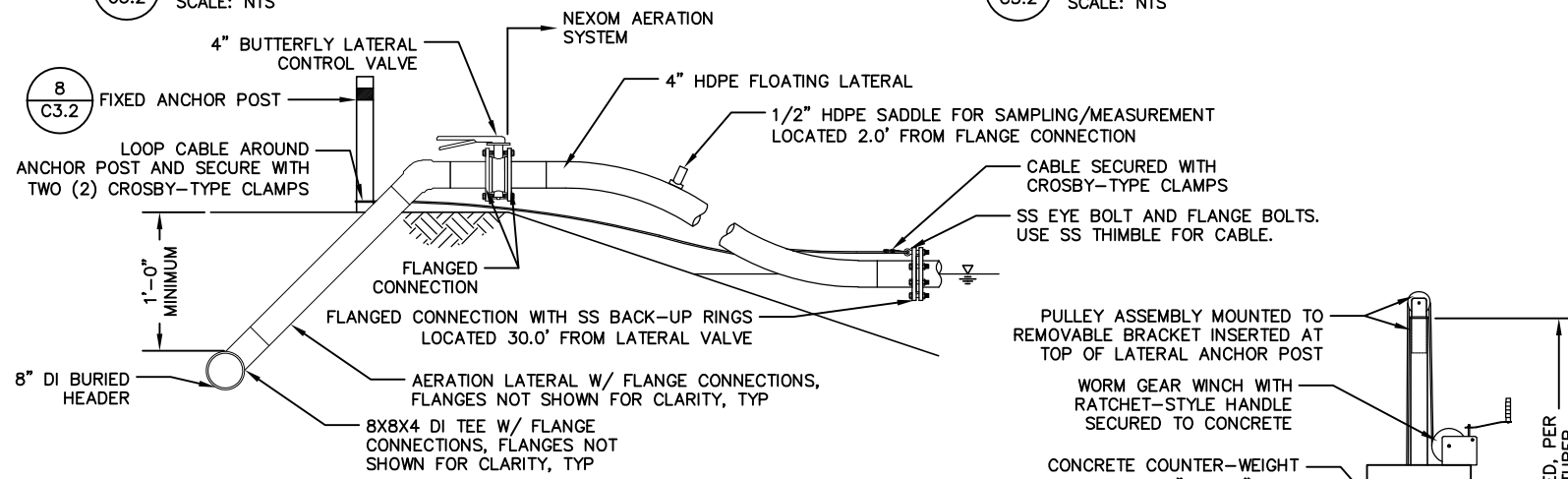
3 ROPE CONNECTION DETAIL
 C3.2 SCALE: NTS



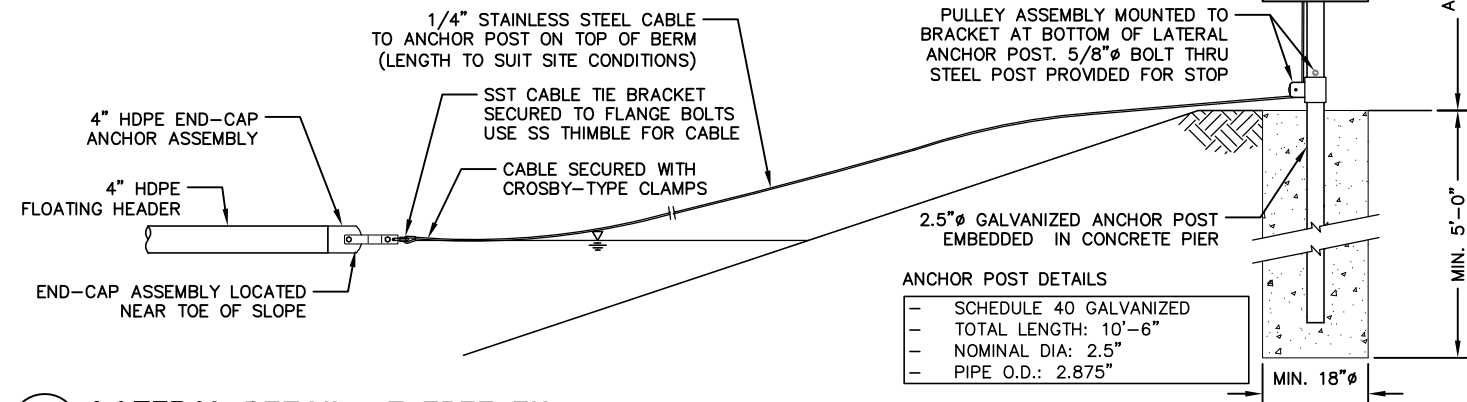
4 HT25-8 DIFFUSER - PLAN
 C3.2 SCALE: NTS



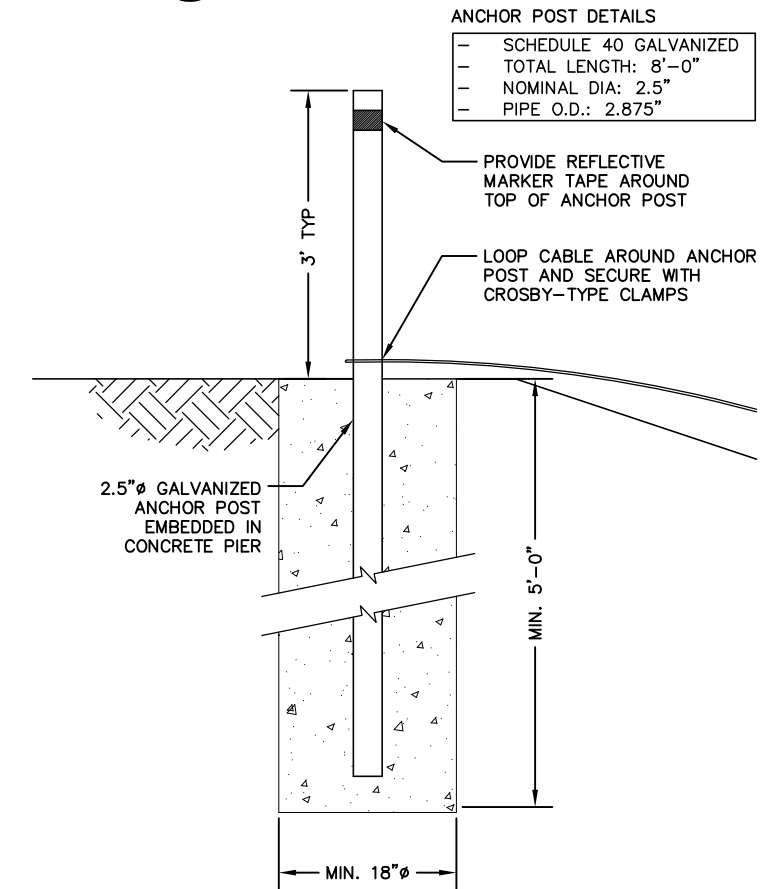
5 DIFFUSER CONNECTION DETAIL
 C3.2 SCALE: NTS



6 LATERAL DETAIL AT HEADER
 C3.2 SCALE: NTS



7 LATERAL DETAIL AT FREE END
 C3.2 SCALE: NTS



8 FIXED ANCHOR POST AT HEADER DETAIL
 C3.2 SCALE: NTS

REVISIONS				REVISIONS			
NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION

Bristol
 ENGINEERING SERVICES COMPANY, LLC
 111 W. 16th Avenue, Third Floor
 Anchorage, AK 99501
 Phone (907) 563-0013 Fax (907) 563-6713
 License Number: AECC697

CITY OF DILLINGHAM
 ALASKA

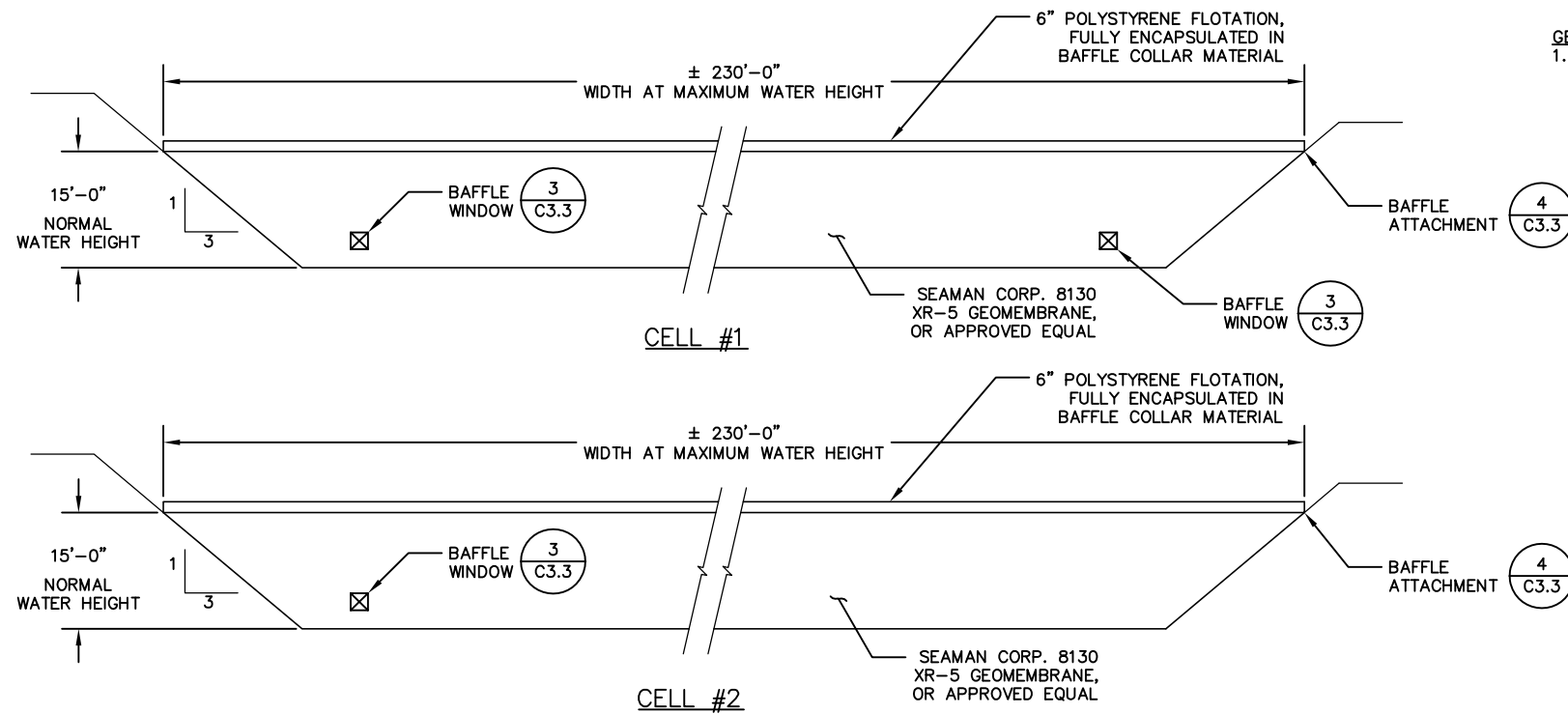
49th VANESSA WIKE
 No. CE-9474
 04/30/2019
 REGISTERED PROFESSIONAL ENGINEER

AERATED LAGOON FACILITY IMPROVEMENTS
 DILLINGHAM, ALASKA
**LAGOON IMPROVEMENTS
 AERATION SYSTEM DETAILS**

SCALE: SHOWN DESIGNED: VBW CHECKED: IPP DRAWN: DKH DATE: APR 2019 SHEET **8** OF **16**

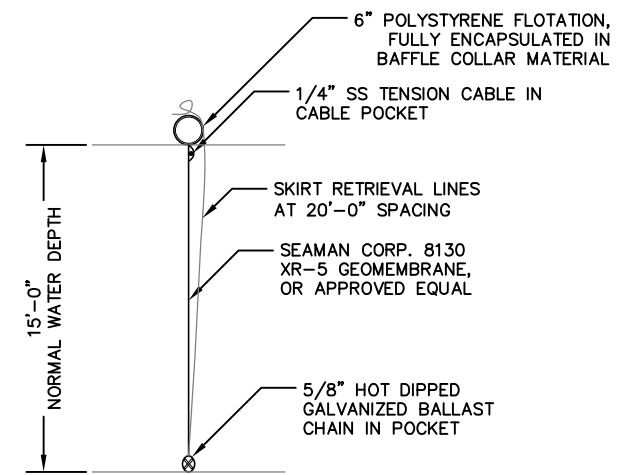
SHEET NO.
C3.2

User: JWANDER Apr 30, 2019 - 9:19am
 Drawing: K:\JOBS\32190033_DLG LAGOON IMPROVEMENTS DETAILS.DWG - Layout: C3.3
 Xrefs: XREF_32190033_TITLEBLOCK.DWG - Images: 32190033_AIRMAN_HOLE.PNG

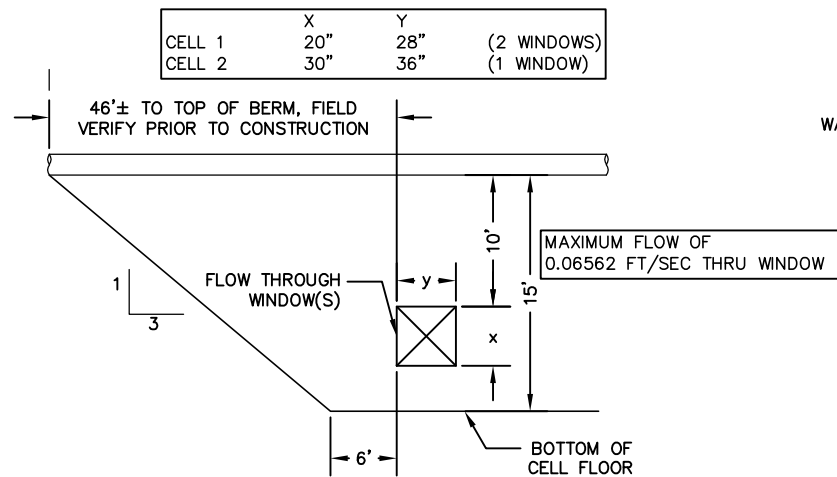


1 BAFEL CURTAIN DETAIL
 SCALE: NTS

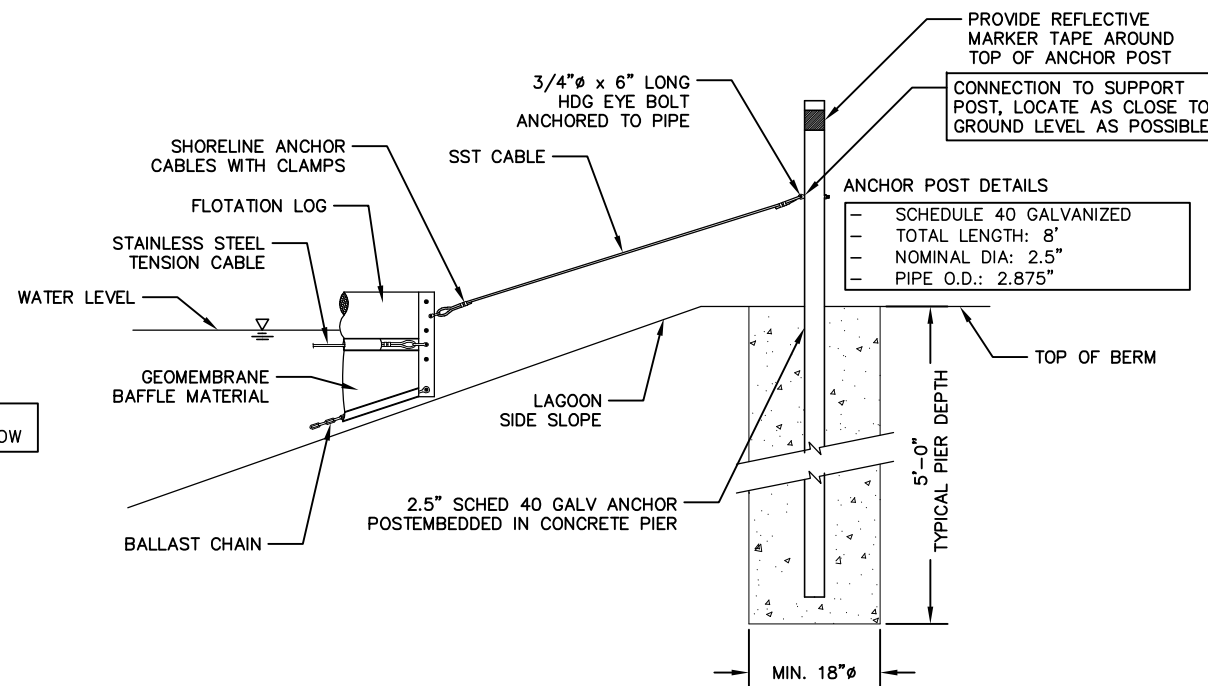
GENERA NOTES:
 1. BAFFLE CONSTRUCTION MAY VARY, INSTALL BAFFLE SYSTEM PER MANUFACTURERS RECOMMENDATIONS.



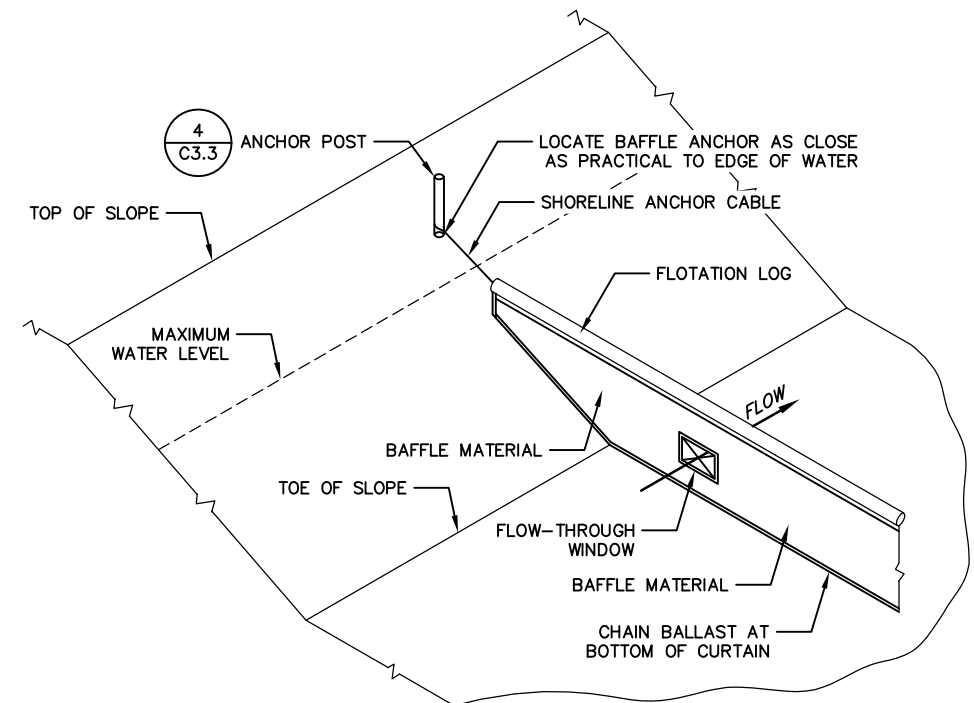
A BAFFLE CURTAIN TYPICAL SECTION
 SCALE: NTS



3 BAFEL CURTAIN WINDOW DETAIL
 SCALE: NTS



4 BAFFLE CURTAIN ATTACHMENT DETAIL
 SCALE: NTS



5 BAFFLE CURTAIN - ISOMETRIC
 SCALE: NTS

REVISIONS				REVISIONS			
NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION

Bristol
 ENGINEERING SERVICES COMPANY, LLC
 111 W. 16th Avenue, Third Floor
 Anchorage, AK 99501
 Phone (907) 563-0013 Fax (907) 563-6713
 License Number: AECC697

CITY OF DILLINGHAM
 ALASKA

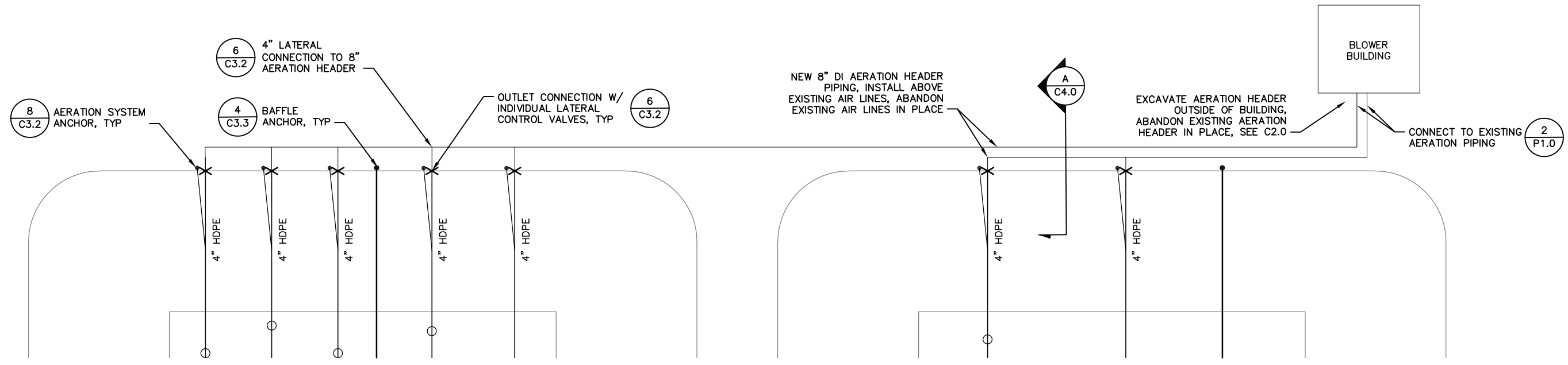
STATE OF ALASKA
 49th

 VANESSA WIKE
 No. CE-9474
 04/30/2019
 REGISTERED PROFESSIONAL ENGINEER

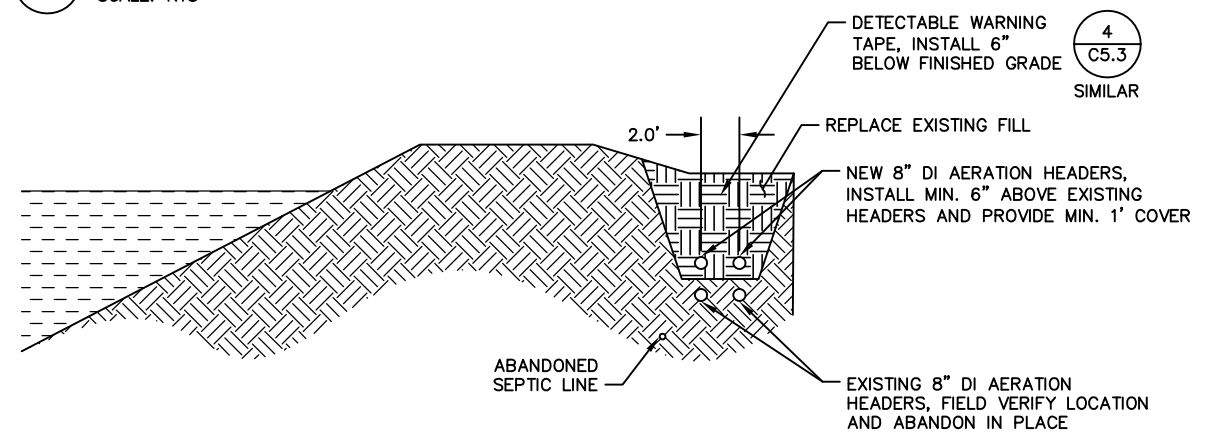
AERATED LAGOON FACILITY IMPROVEMENTS
 DILLINGHAM, ALASKA
**LAGOON IMPROVEMENTS
 BAFFLE DETAILS**

SCALE: SHOWN DESIGNED: VBW CHECKED: IPP DRAWN: DKH DATE: APR 2019 SHEET 9 OF 16

User: JWANDER Apr 30, 2019 - 9:20am
 Drawing: K:\JOBS\32190033 DLG LAGOON\ACAD-DESIGN\CIVIL\32190033_C4.0_AERATION HEADER.DWG - Layout: C4.0
 Xrefs: (DIESEL evaluation failed) - Images: DILLINGHAM-ORTHO.JPG



1 AERATION HEADER PIPING PLAN
 C4.0 SCALE: NTS



A AERATION HEADER PIPING SECTION
 C4.0 SCALE: NTS

REVISIONS				REVISIONS			
NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION

Project No. 32190033

Bristol
 ENGINEERING SERVICES COMPANY, LLC
 111 W. 16th Avenue, Third Floor
 Anchorage, AK 99501
 Phone (907) 563-0013 Fax (907) 563-6713
 License Number: AECC697

CITY OF DILLINGHAM
 A L A S K A

STATE OF ALASKA
 49th
 VANESSA WIKE
 No. CE-9474
 04/30/2019
 REGISTERED PROFESSIONAL ENGINEER

AERATED LAGOON FACILITY IMPROVEMENTS
 DILLINGHAM, ALASKA

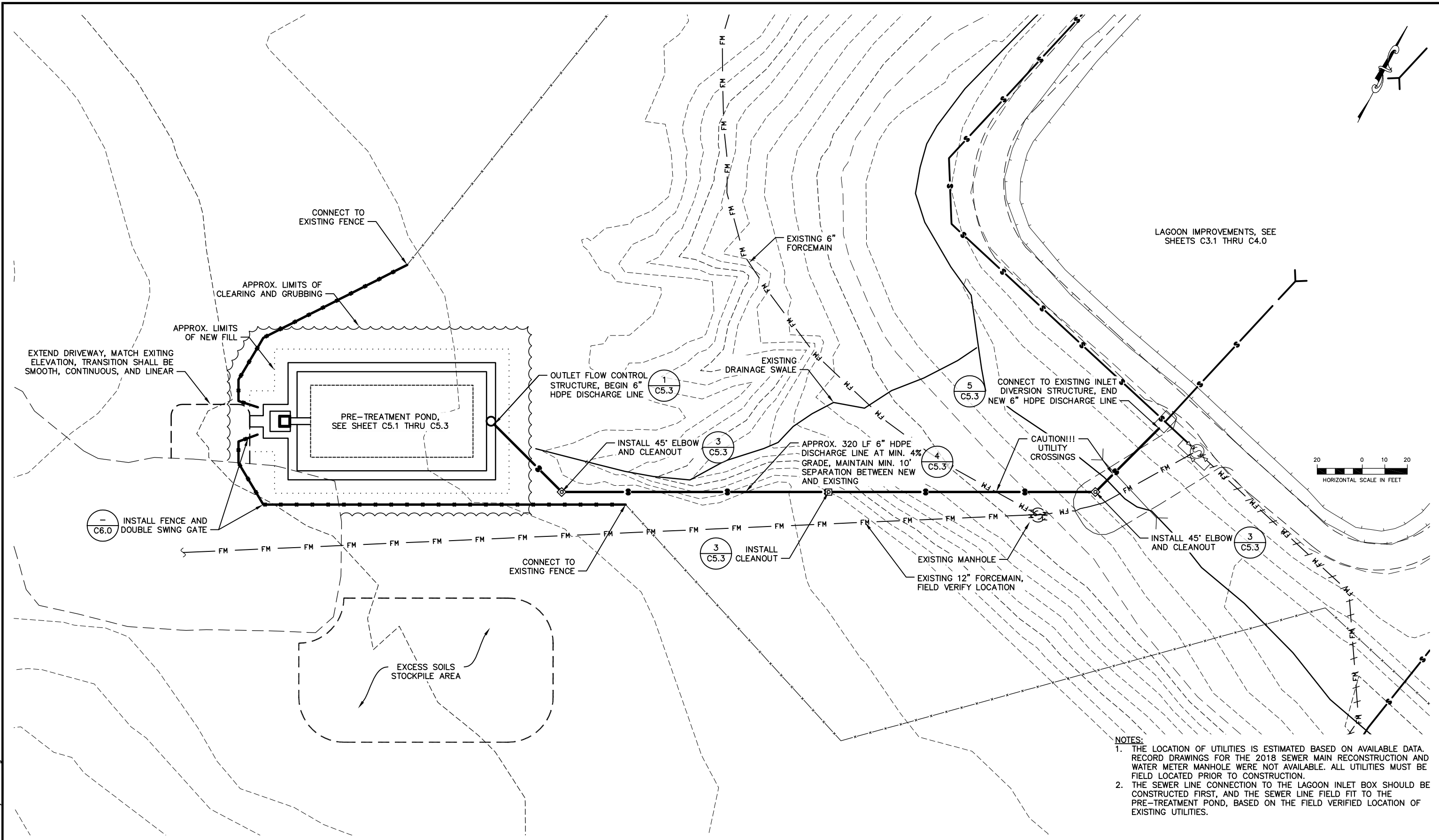
**LAGOON IMPROVEMENTS
 AERATION HEADER PLAN AND SECTION**

SCALE: SHOWN | DESIGNED: VBW | CHECKED: IPP | DRAWN: DKH | DATE: APR 2019

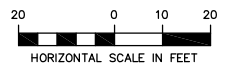
SHEET NO.
C4.0

SHEET 10 OF 16

User: JWANDER Apr 30, 2019 - 9:20am
 Drawing: K:\JOBS\32190033 DLG LAGOON\ACAD-DESIGN\CIVIL\32190033_C5.0-5.3_PRE-TREATMENT POND.DWG - Layout: C5.0
 Xrefs: (DIESEL evaluation failed) - Images: DILLINGHAM-ORTHO.JPG



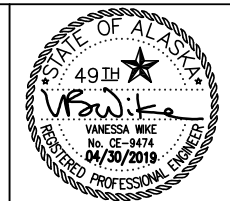
- NOTES:**
1. THE LOCATION OF UTILITIES IS ESTIMATED BASED ON AVAILABLE DATA. RECORD DRAWINGS FOR THE 2018 SEWER MAIN RECONSTRUCTION AND WATER METER MANHOLE WERE NOT AVAILABLE. ALL UTILITIES MUST BE FIELD LOCATED PRIOR TO CONSTRUCTION.
 2. THE SEWER LINE CONNECTION TO THE LAGOON INLET BOX SHOULD BE CONSTRUCTED FIRST, AND THE SEWER LINE FIELD FIT TO THE PRE-TREATMENT POND, BASED ON THE FIELD VERIFIED LOCATION OF EXISTING UTILITIES.



REVISIONS			
NO.	DATE	BY	DESCRIPTION

REVISIONS			
NO.	DATE	BY	DESCRIPTION

Bristol
 ENGINEERING SERVICES COMPANY, LLC
 111 W. 16th Avenue, Third Floor
 Anchorage, AK 99501
 Phone (907) 563-0013 Fax (907) 563-6713
 License Number: AECC697



**AERATED LAGOON FACILITY IMPROVEMENTS
 DILLINGHAM, ALASKA**

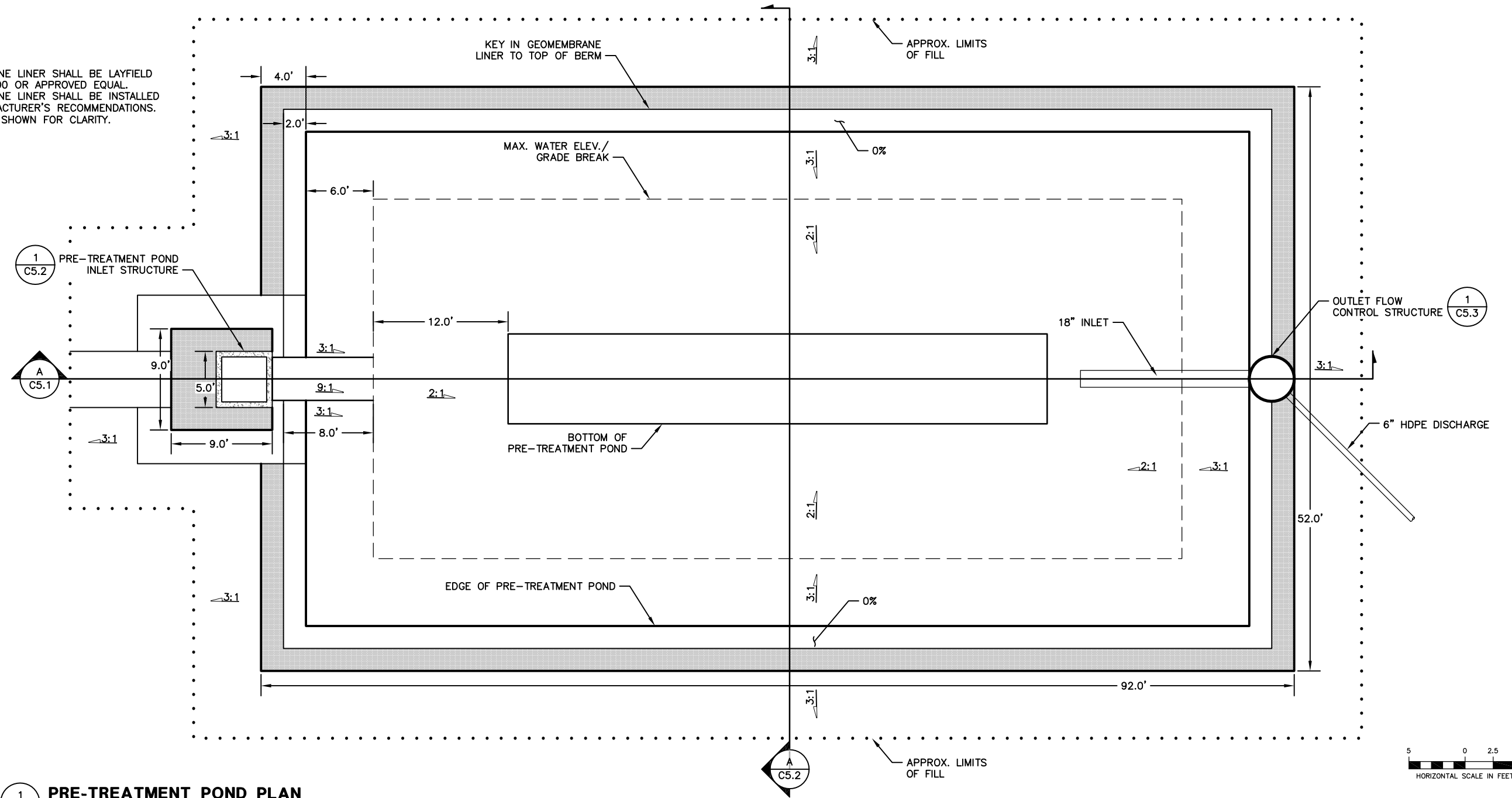
**PRE-TREATMENT POND
 SITE PLAN**

SCALE: SHOWN DESIGNED: VBW CHECKED: IPP DRAWN: DKH DATE: APR 2019

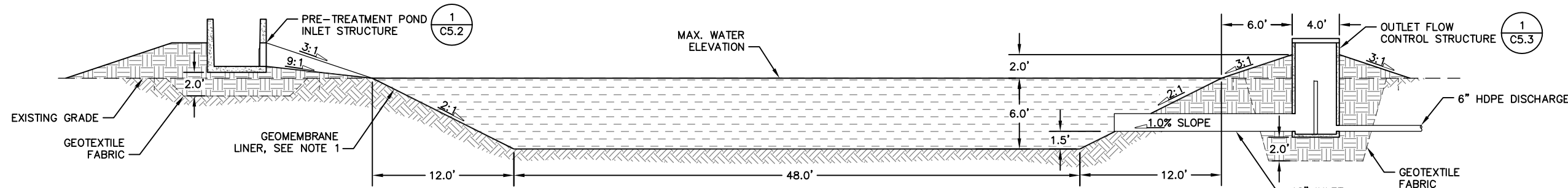
SHEET NO.	C5.0
SHEET 11 OF 16	

User: JWANDER Apr 30, 2019 - 9:20am
 Drawing: K:\JOBS\32190033 DLG LAGOON\ACAD-DESIGN\CIVIL\32190033_C5.0-5.3_PRE-TREATMENT POND.DWG - Layout: C5.1
 Xrefs: (DIESEL evaluation failed) - Images: DILLINGHAM-ORTHO.JPG

- NOTES:**
1. GEOMEMBRANE LINER SHALL BE LAYFIELD HAZGARD 100 OR APPROVED EQUAL.
 2. GEOMEMBRANE LINER SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
 3. FENCE NOT SHOWN FOR CLARITY.



1 PRE-TREATMENT POND PLAN
 C5.1 SCALE: SHOWN



A PRE-TREATMENT POND SECTION
 C5.1 SCALE: NTS

REVISIONS

NO.	DATE	BY	DESCRIPTION

REVISIONS

NO.	DATE	BY	DESCRIPTION

Project No. 32190033

Bristol
 ENGINEERING SERVICES COMPANY, LLC
 111 W. 16th Avenue, Third Floor
 Anchorage, AK 99501
 Phone (907) 563-0013 Fax (907) 563-6713
 License Number: AECC697

CITY OF DILLINGHAM
 ALASKA

STATE OF ALASKA
 49th
 VANESSA WIKI
 No. CE-9474
 04/30/2019
 REGISTERED PROFESSIONAL ENGINEER

AERATED LAGOON FACILITY IMPROVEMENTS
 DILLINGHAM, ALASKA

**PRE-TREATMENT POND
 PLAN AND SECTION**

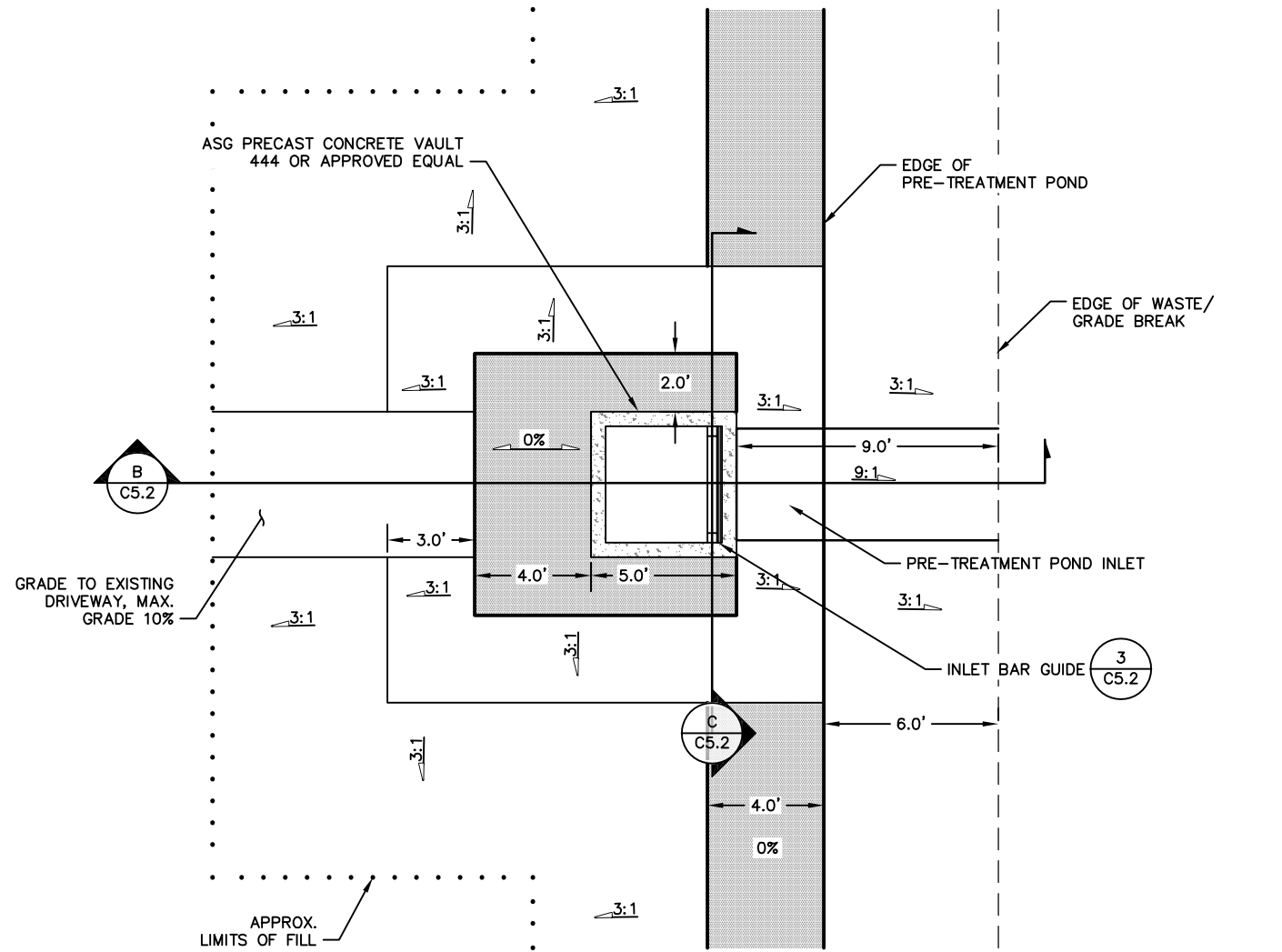
SCALE: SHOWN DESIGNED: VBW CHECKED: IPP DRAWN: DKH DATE: APR 2019

SHEET NO.

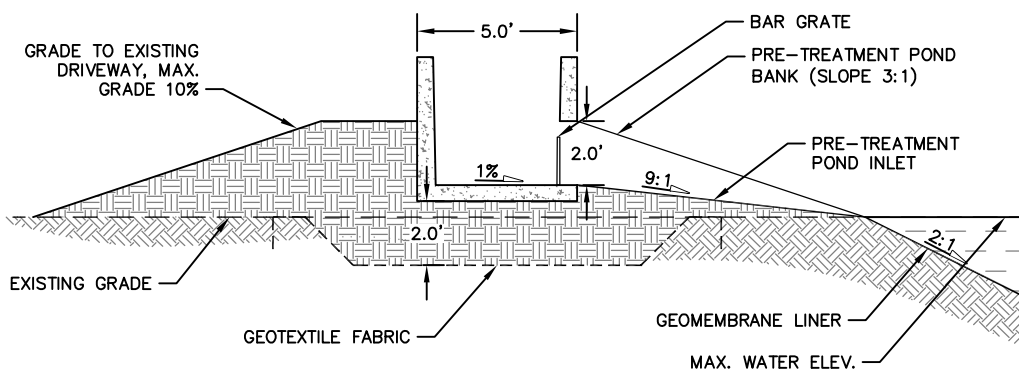
C5.1

SHEET 12 OF 16

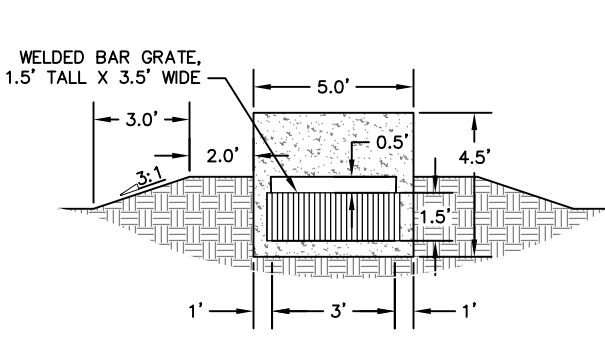
User: JWANDER Apr 30, 2019 - 9:20am
 Drawing: K:\JOBS\32190033 DLG LAGOON\ACAD-DESIGN\CIVIL\32190033_C5.0-5.3_PRE-TREATMENT POND.DWG - Layout: C5.2
 Xrefs: (DIESEL evaluation failed) - Images: DILLINGHAM-ORTHO.JPG



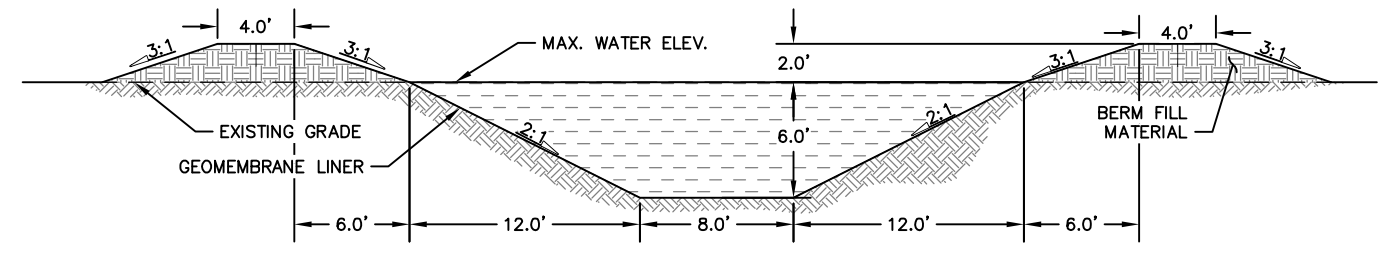
1 INLET STRUCTURE PLAN
 C5.2 SCALE: NTS



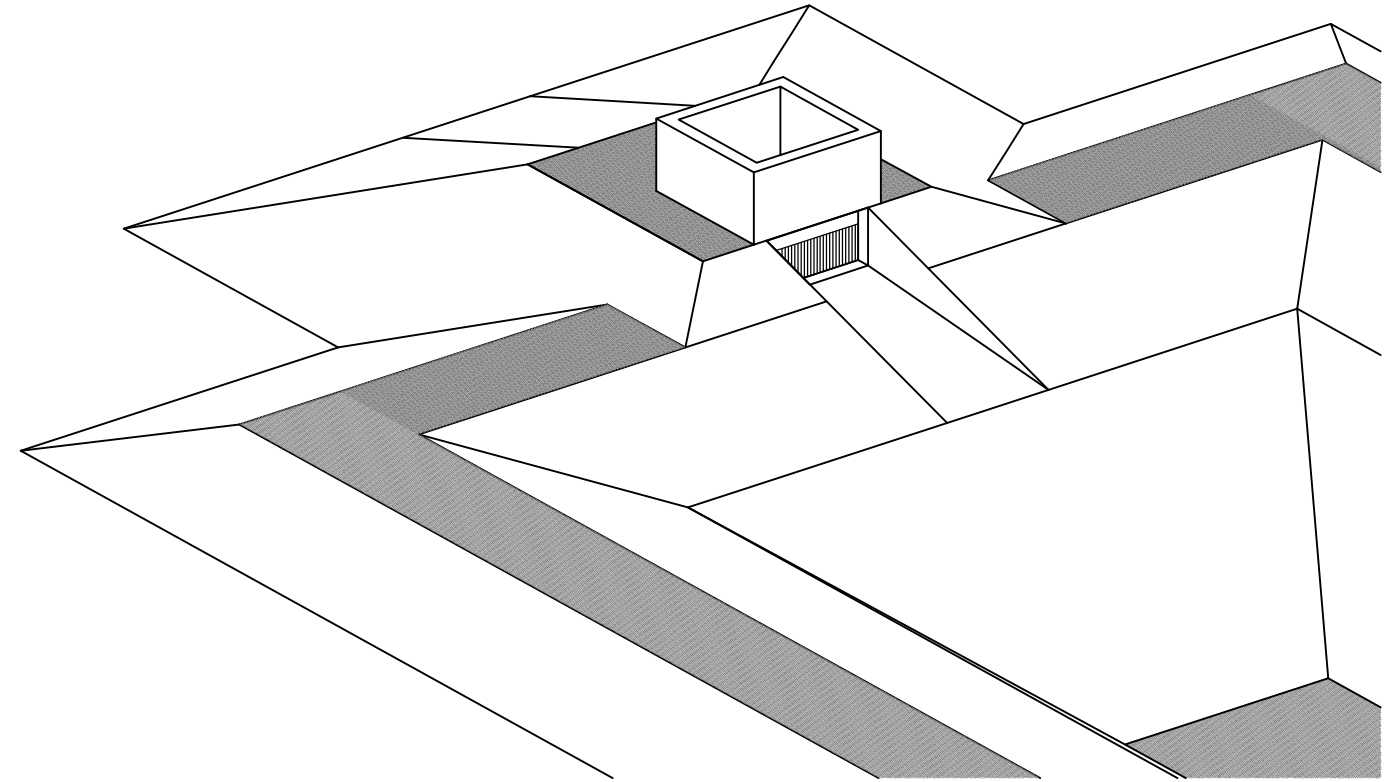
B INLET STRUCTURE SECTION
 C5.2 SCALE: NTS



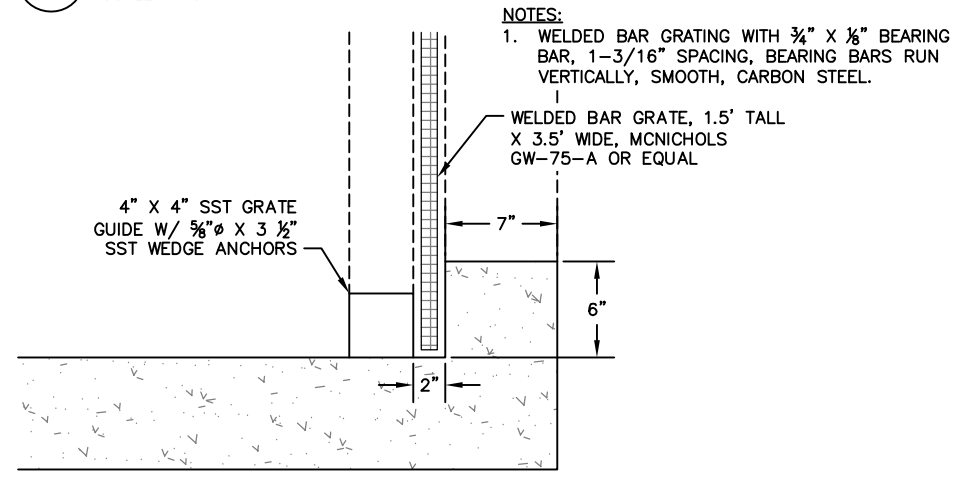
C INLET STRUCTURE SECTION
 C5.2 SCALE: NTS



A PRE-TREATMENT POND SECTION
 C5.2 SCALE: NTS



2 INLET STRUCTURE ISOMETRIC
 C5.2 SCALE: NTS



3 INLET STRUCTURE BAR GUIDE
 C5.2 SCALE: NTS

NOTES:
 1. WELDED BAR GRATING WITH 3/4" X 1/8" BEARING BAR, 1-3/16" SPACING, BEARING BARS RUN VERTICALLY, SMOOTH, CARBON STEEL.
 WELDED BAR GRATE, 1.5' TALL X 3.5' WIDE, MCNICHOLS GW-75-A OR EQUAL

REVISIONS				REVISIONS			
NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION

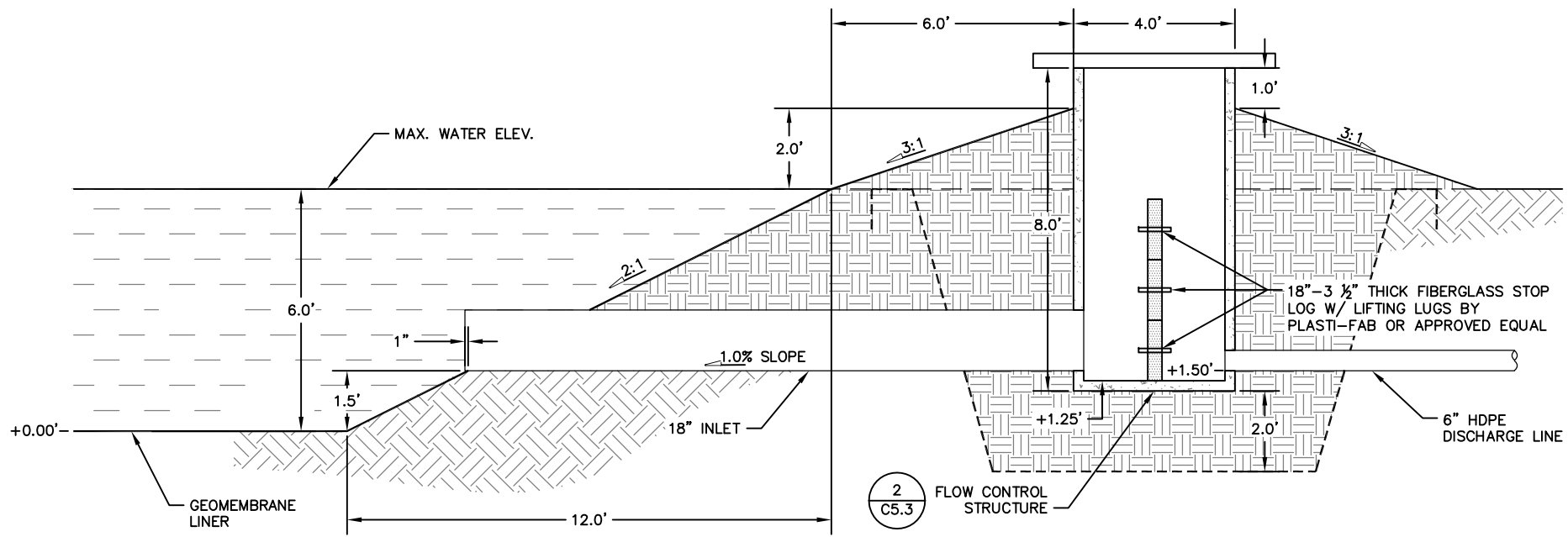
Bristol
 ENGINEERING SERVICES COMPANY, LLC
 111 W. 16th Avenue, Third Floor
 Anchorage, AK 99501
 Phone (907) 563-0013 Fax (907) 563-6713
 License Number: AECC697

CITY OF DILLINGHAM
 ALASKA

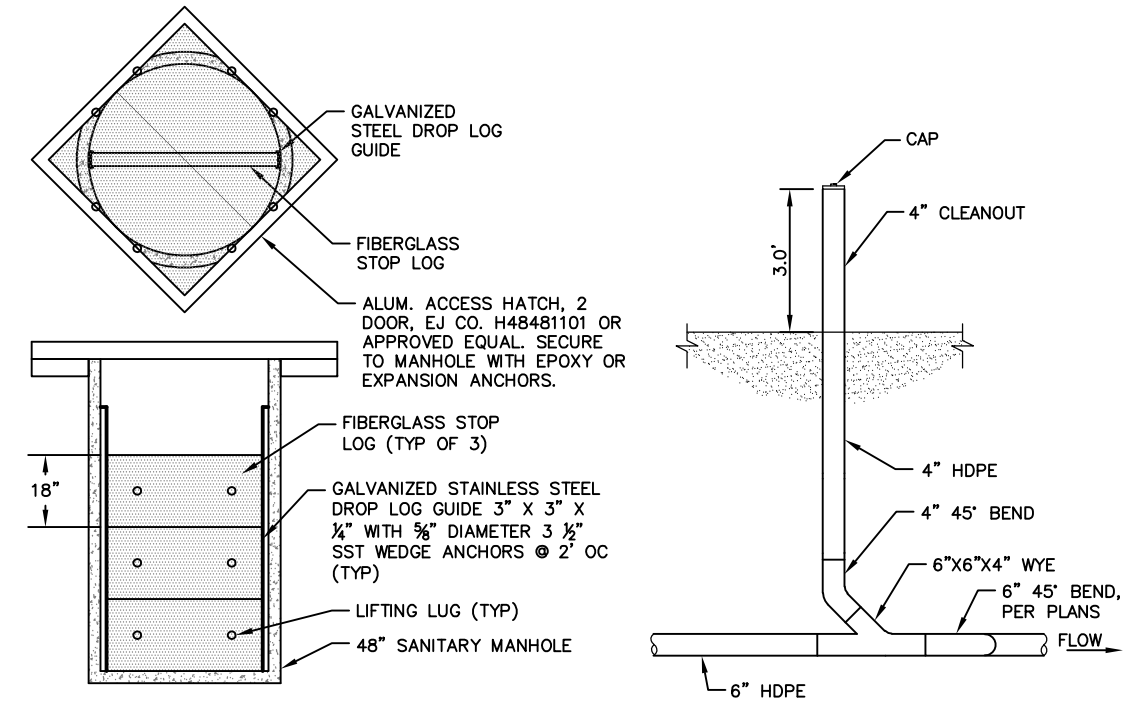
STATE OF ALASKA
 49th
 VANESSA WIKI
 No. CE-9474
 04/30/2019
 REGISTERED PROFESSIONAL ENGINEER

AERATED LAGOON FACILITY IMPROVEMENTS
 DILLINGHAM, ALASKA
PRE-TREATMENT POND INLET DETAILS
 SCALE: SHOWN DESIGNED: VBW CHECKED: IPP DRAWN: DKH DATE: APR 2019

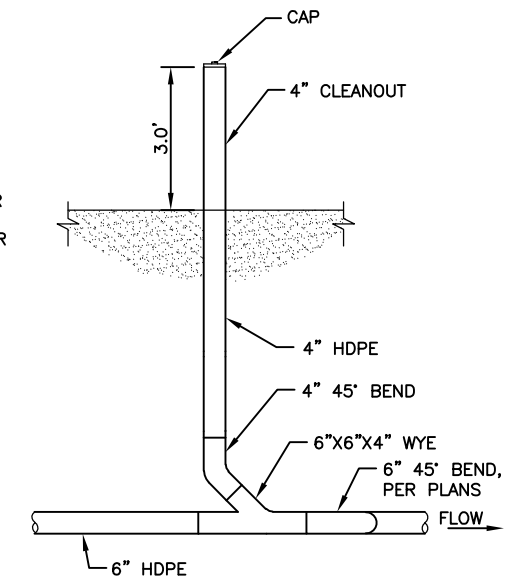
SHEET NO.
C5.2
 SHEET 13 OF 16



1
C5.3 **OUTLET FLOW CONTROL STRUCTURE DETAILS**
SCALE: NTS

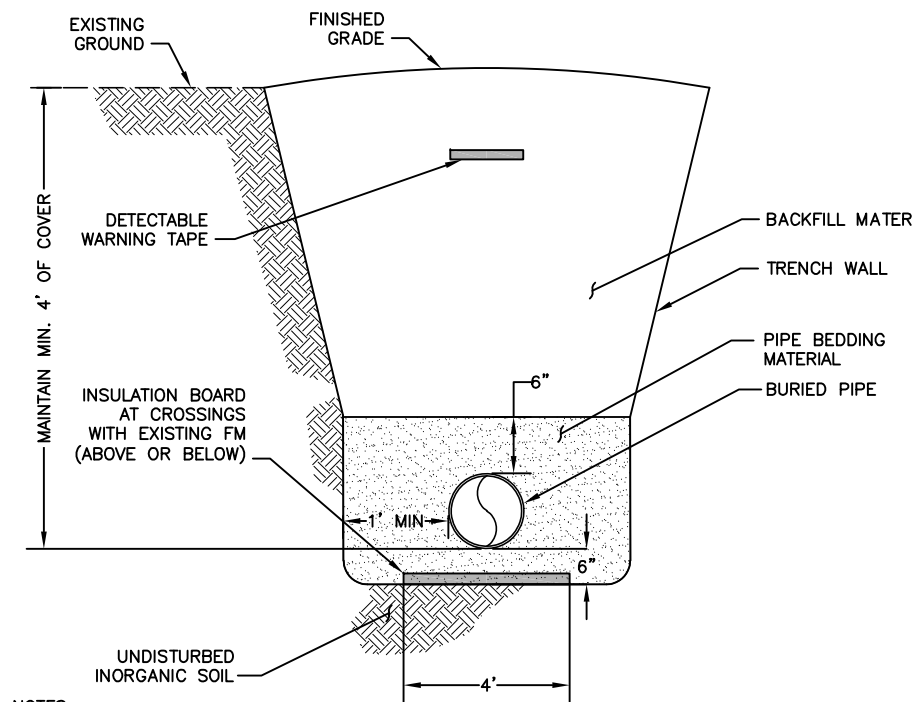


2
C5.3 **OUTLET FLOW CONTROL**
SCALE: NTS



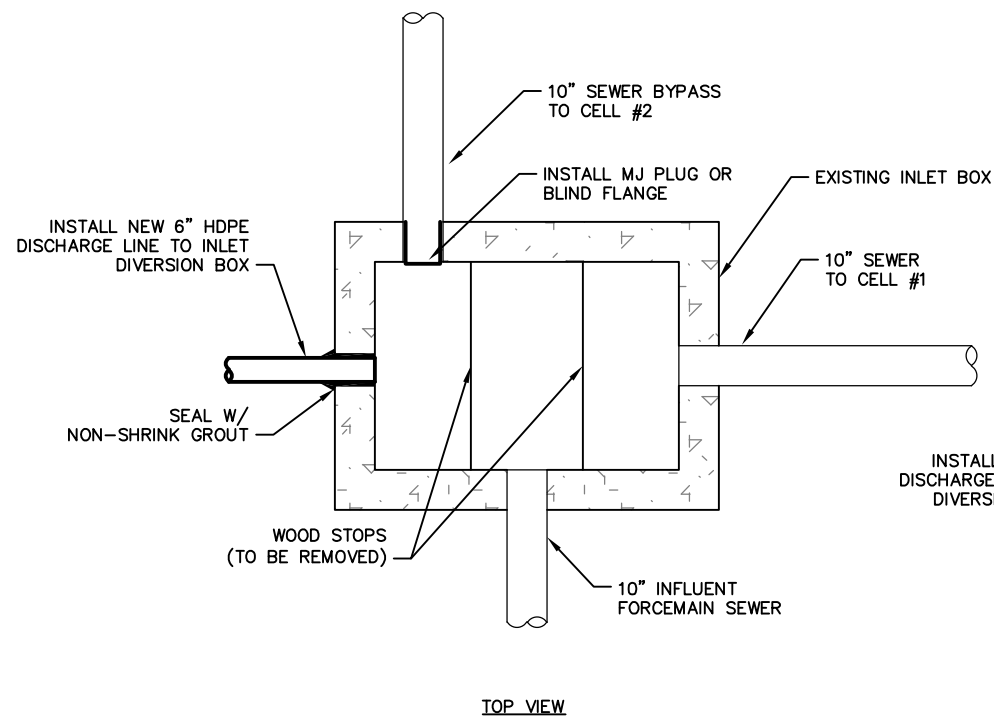
3
C5.3 **CLEANOUT DETAIL**
SCALE: NTS

NOTES:
1. OUTLET VAULT AND STOP LOGS TO BE INSTALLED LEVEL IN BOTH DIRECTIONS.

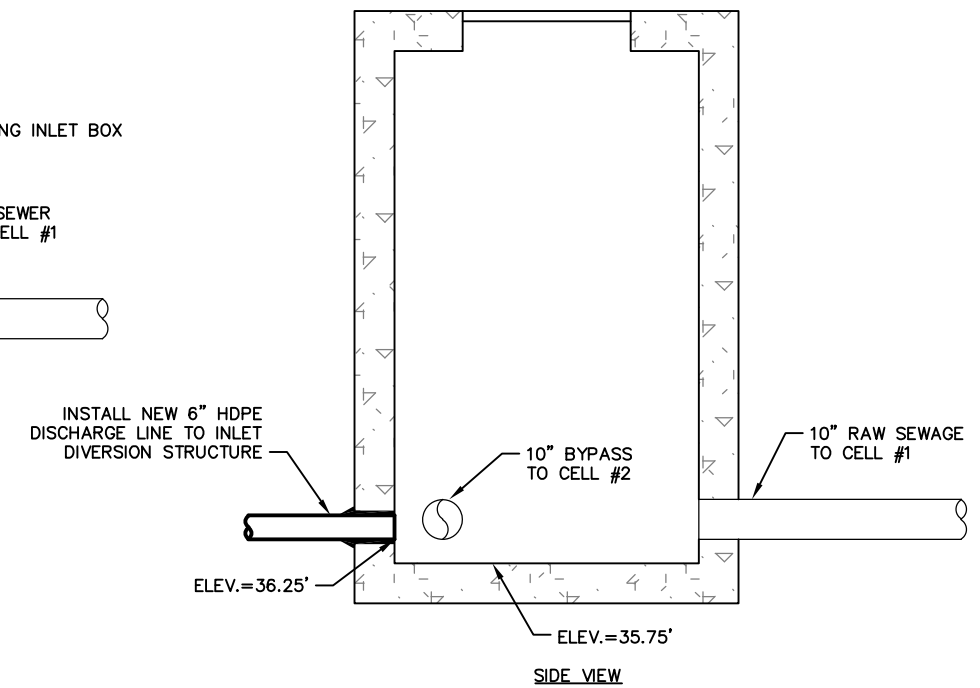


NOTES:
1. PIPE BEDDING MATERIAL SHALL BE A CLEAN WELL GRADED MATERIAL WITH A MAXIMUM PARTICLE SIZE OF 2" AND NOT MORE THAN 6% PASSING THE #200 SIEVE. MATERIAL SHALL BE COMPACTED TO 95% MDD IN TRAFFIC AREAS AND 90% ELSEWHERE.
2. TRENCH WALL SHALL BE SLOPED OR SHORED IN CONFORMANCE WITH ALL APPLICABLE SAFETY STANDARDS.
3. OVER EXCAVATE AND FILL WITH CLASSIFIED FILL IN AREAS OF ICE CONTENT OR PEAT.
4. INSURE THAT BEDDING MATERIAL IS PLACED AND CONSOLIDATED BELOW THE PIPE HAUNCHES.

4
C5.3 **TYPICAL TRENCH SECTION**
SCALE: NTS



5
C5.3 **CONNECTION TO EXISTING LAGOON INLET STRUCTURE**
SCALE: NTS



User: JWANDER Apr 30, 2019 - 9:20am
Drawing: K:\JOBS\32190033 DLG LAGOON\ACAD-DESIGN\CIVIL\32190033_C5.0-5.3_PRE-TREATMENT POND.DWG - Layout: C5.3
Xrefs: (DIESEL evaluation failed)

REVISIONS				REVISIONS			
NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION

Bristol
ENGINEERING SERVICES COMPANY, LLC
111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
Phone (907) 563-0013 Fax (907) 563-6713
License Number: AECC697

CITY OF DILLINGHAM ALASKA

STATE OF ALASKA
49th
Vanessa Wike
No. CE-9474
04/30/2019
REGISTERED PROFESSIONAL ENGINEER

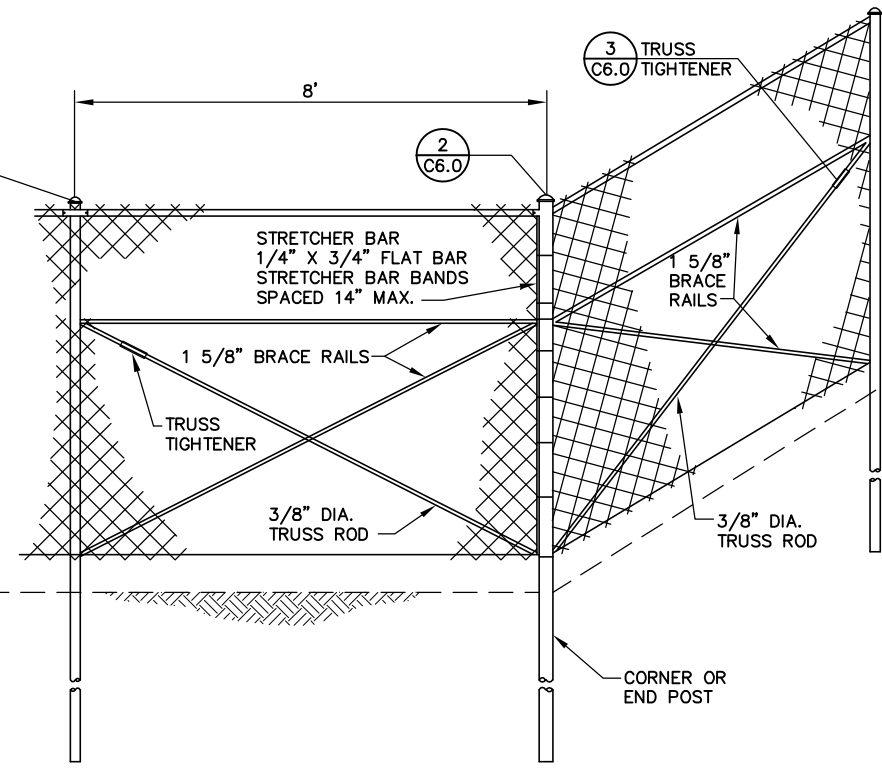
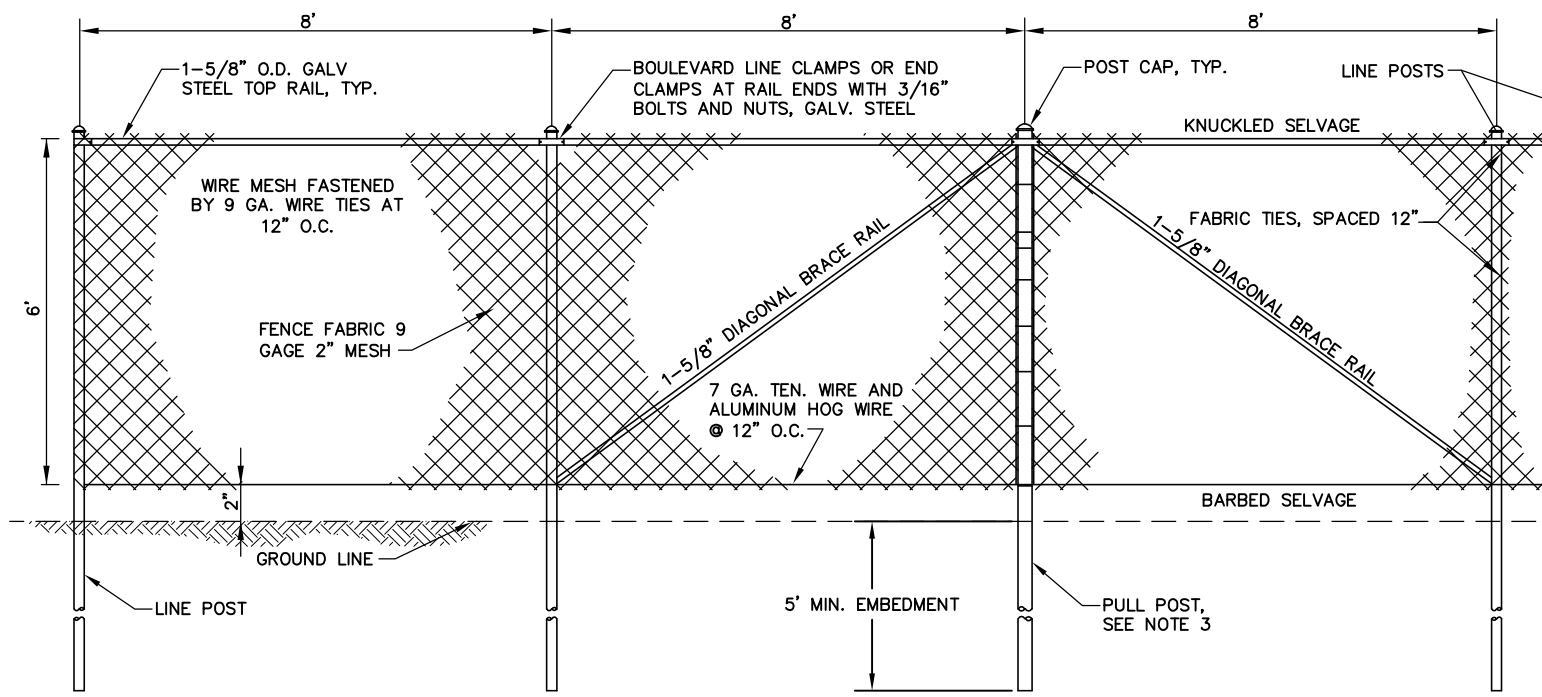
AERATED LAGOON FACILITY IMPROVEMENTS
DILLINGHAM, ALASKA

**PRE-TREATMENT POND
OUTLET AND DISCHARGE LINE DETAILS**

SCALE: SHOWN | DESIGNED: VBW | CHECKED: IPP | DRAWN: DKH | DATE: APR 2019

SHEET NO. **C5.3**
SHEET 14 OF 16

User: JWANDER Apr 30, 2019 - 9:20am
 Drawing: K:\JOBS\32190033_DLG LAGOON\ACAD-DESIGN\CIVIL\32190033_C6.0_FENCE DETAILS.DWG - Layout: C6.0
 Xrefs: XREF_32190033_TITLEBLOCK.DWG - Images: None

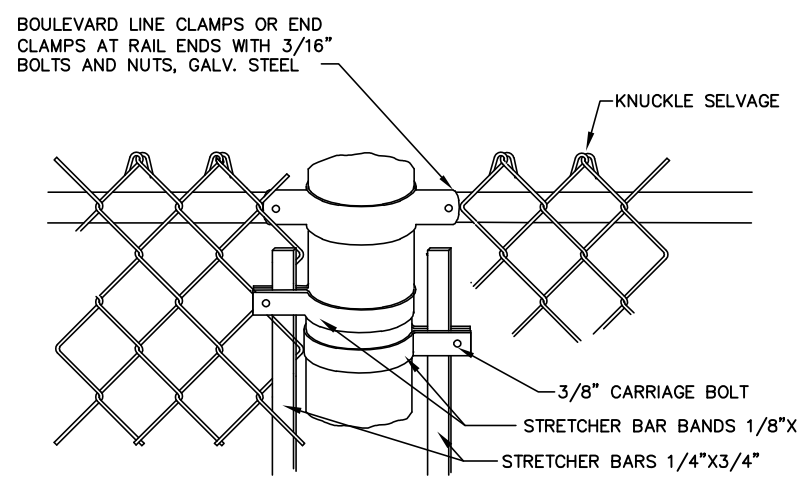


- FENCE NOTES:**
1. POSTS SHALL BE DRIVEN OR AUGURED AS SHOWN.
 2. PULL POSTS SHALL BE SPACED AT 50' INTERVALS OR LESS.
 3. POST TOPS SHALL BE SECURELY FASTENED TO POST
 4. BRACE RAILS AND TRUSS RODS SHALL BE SECURELY FASTENED TO POST WITH BRACE BANDS WITH THREADED TAKE-UP ADAPTOR FOR TRUSS RODS
 5. FABRIC SHALL BE STRETCHED TO A SMOOTH UNIFORM APPEARANCE.
 6. FABRIC SHALL BE PLACED ON ROAD SIDE OF POST.
 7. DETAILS SHOWN INDICATE GENERAL DESIGN AND DIMENSIONS MAY VARY AMONG MANUFACTURERS.
 8. SWING GATES SHALL BE CONSTRUCTED WITH GATE STOP, PADLOCK, AND LATCH ASSEMBLY.
 9. GATE FABRIC SHALL BE OF THE SAME DESIGN AND HEIGHT OF LINE FENCE FABRIC.
 10. GATE FABRIC SHALL BE FURNISHED WITH KNUCKLE SELVAGE TOP AND BOTTOM.
 11. GATE FRAMES MAY BE FABRICATED BY WELDING OR RIVETING AND SHALL BE BRACED TO ELIMINATE SAGGING. HINGES, LATCHES AND OTHER GATE APPURTENANCES SHALL BE OF SUFFICIENT STRENGTH AND DESIGN TO ASSURE EASY TROUBLE FREE OPERATION.
 12. ALL FENCING SHALL HAVE A 1.2 OZ/SF GALVANIZED COATING.
 13. CONTRACTOR TO PROVIDE COMPLETE SHOP DRAWINGS SUBMITTAL FOR NEW PROJECT FENCING.
 14. TUBING LIGHTER THAN SCHEDULE 40 IS NOT ACCEPTABLE.
 15. COORDINATE SIGN TEXT AND CONTACT NUMBER WITH OWNER PRIOR TO ORDERING.

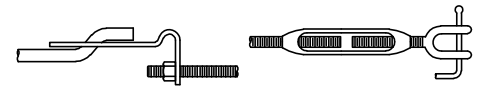
1 TYPICAL FENCE DETAIL
 SCALE: NTS

FABRIC HEIGHT	POST		TOP OR BRACE RAIL PIPE SIZE
	END-CORNER-PULL PIPE SIZE	LINE-BRACE PIPE SIZE	
6'	4"	3"	1 5/8"

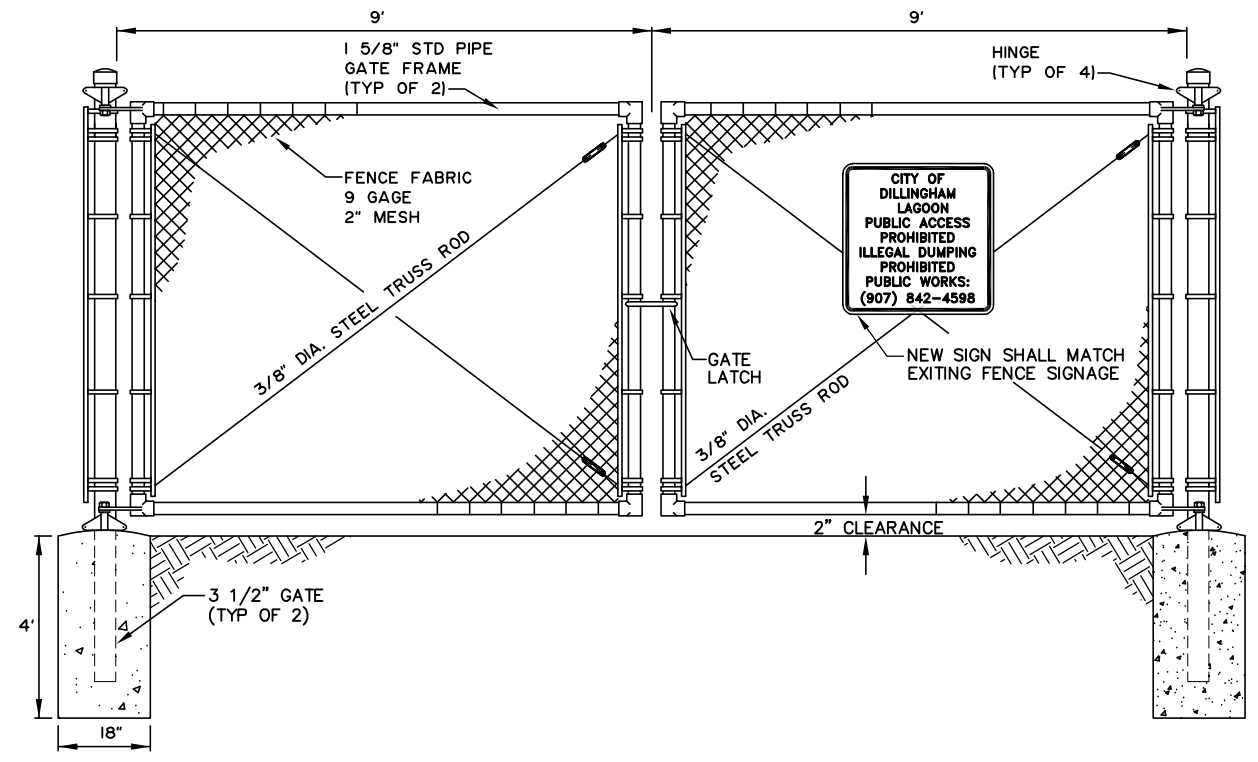
ALL PIPES SHALL BE SCH 40 ASTM F1083 E>30,000 PSI



2 END - CORNER - PULL POST TOP DETAIL
 SCALE: NTS



3 TRUSS ROD DETAIL
 SCALE: NTS



4 DOUBLE SWING GATE DETAIL
 SCALE: NTS

REVISIONS				REVISIONS			
NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION

Bristol
 ENGINEERING SERVICES COMPANY, LLC
 111 W. 16th Avenue, Third Floor
 Anchorage, AK 99501
 Phone (907) 563-0013 Fax (907) 563-6713
 License Number: AECC697

CITY OF DILLINGHAM ALASKA

STATE OF ALASKA
 49th VANESSA WIKI
 No. CE-9474
 04/30/2019
 REGISTERED PROFESSIONAL ENGINEER

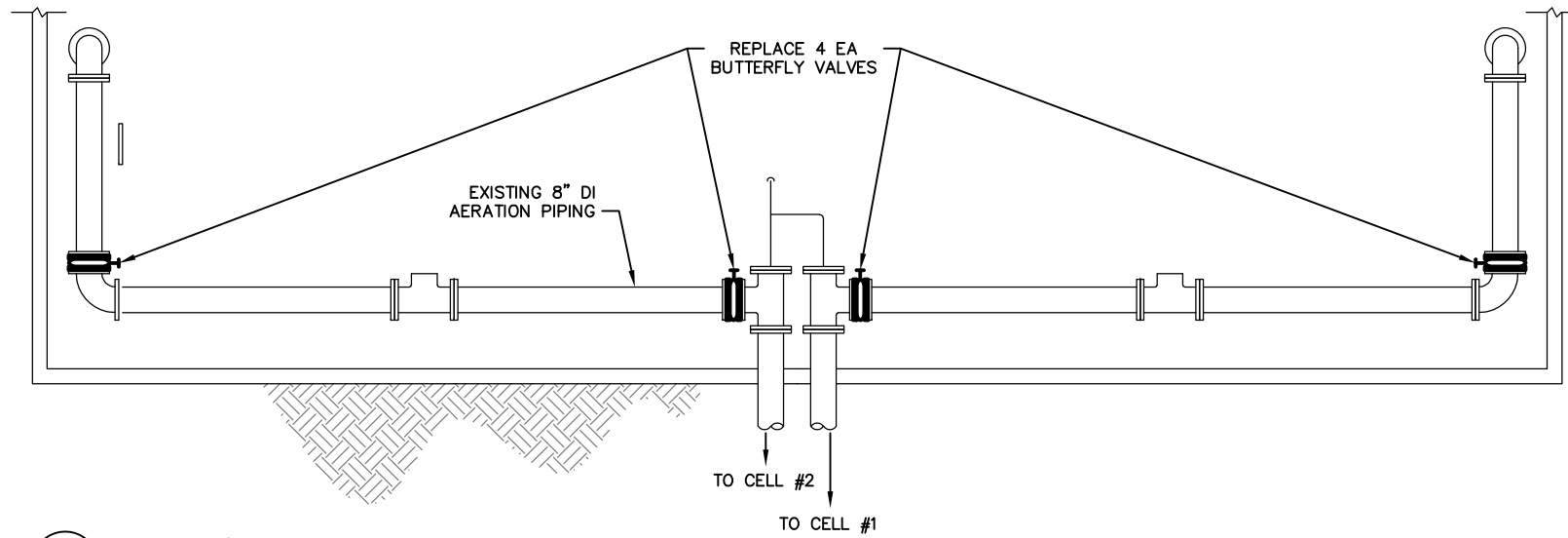
AERATED LAGOON FACILITY IMPROVEMENTS
 DILLINGHAM, ALASKA

FENCE DETAILS

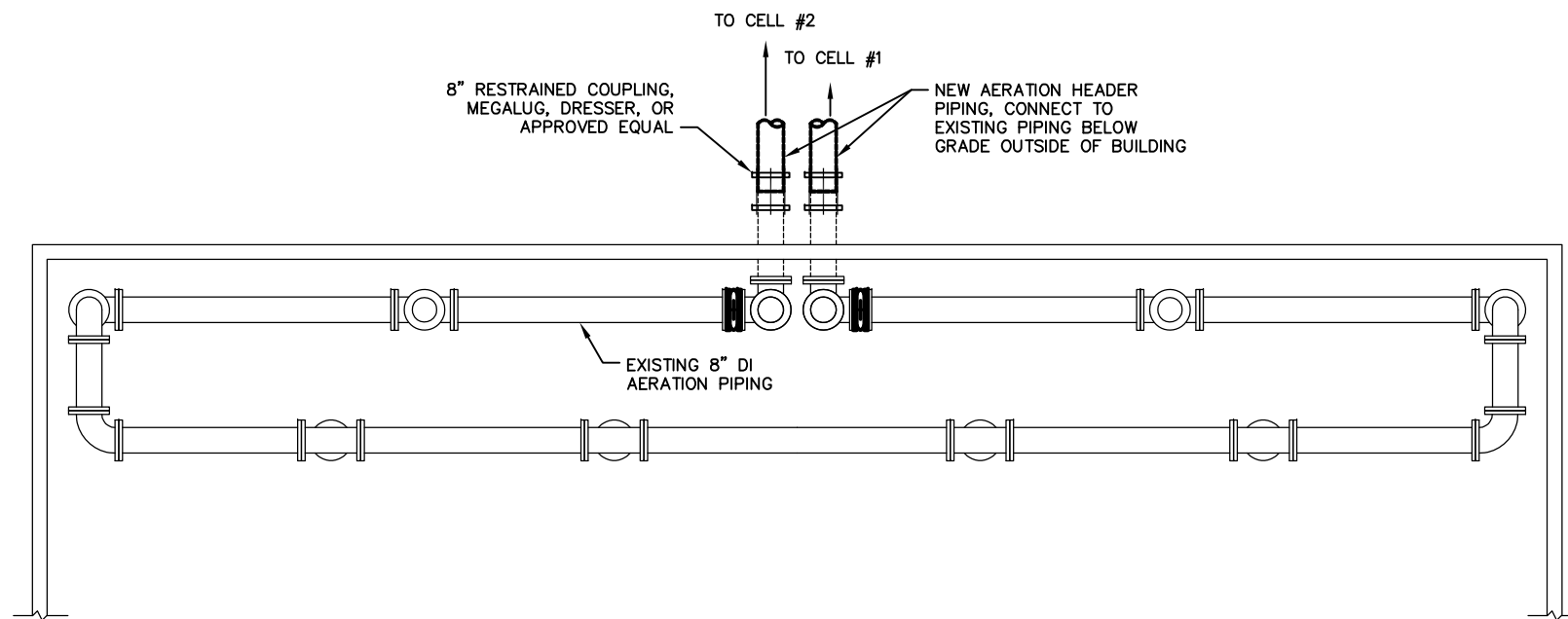
SCALE: SHOWN DESIGNED: VBW CHECKED: IPP DRAWN: DKH DATE: APR 2019 SHEET 15 OF 16

SHEET NO. **C6.0**

User: JWANDER Apr 30, 2019 - 9:20am
 Drawing: K:\JOBS\32190033_DLG LAGOON\ACAD-DESIGN\CIVIL\32190033_P1.0_BLOWER BUILDING VALVE REPLACEMENT DETAILS.DWG - Layout: P1.0
 Xrefs: XREF_32190033_TITLEBLOCK.DWG - Images: (DIESEL evaluation failed)



1 AERATION PIPING - PROFILE VIEW
 P1.0 SCALE: NTS



2 AERATION PIPING - PLAN VIEW
 P1.0 SCALE: NTS

NOTES:

- BUTTERFLY VALVES SHALL BE LUG STYLE WITH EPOXY COATED DUCTILE IRON BODY, EPDM SEAT SECURELY KEYPED INTO THE BODY, ALUMINUM BRONZE DISC, STAINLESS STEEL STEM, DUAL PTFE STEM BEARINGS, LEVER OPERATOR WITH LOCKABLE HANDLE. 150 PSI RATING. NIBCOLD-2000, FNW FIG 712, OR EQUAL.



3 EXISTING BUTTERFLY VALVES
 P1.0 SCALE: NTS

REVISIONS				REVISIONS			
NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION

Project No. 32190033

Bristol
 ENGINEERING SERVICES COMPANY, LLC
 111 W. 16th Avenue, Third Floor
 Anchorage, AK 99501
 Phone (907) 563-0013 Fax (907) 563-6713
 License Number: AECC697

CITY OF DILLINGHAM
 ALASKA

STATE OF ALASKA
 49th
 VANESSA WIKI
 No. CE-9474
 04/30/2019
 REGISTERED PROFESSIONAL ENGINEER

AERATED LAGOON FACILITY IMPROVEMENTS
 DILLINGHAM, ALASKA

**BLOWER BUILDING
 VALVE REPLACEMENT DETAILS**

SCALE: SHOWN | DESIGNED: VBW | CHECKED: IPP | DRAWN: DKH | DATE: APR 2019

SHEET NO.
P1.0

SHEET 16 OF 16