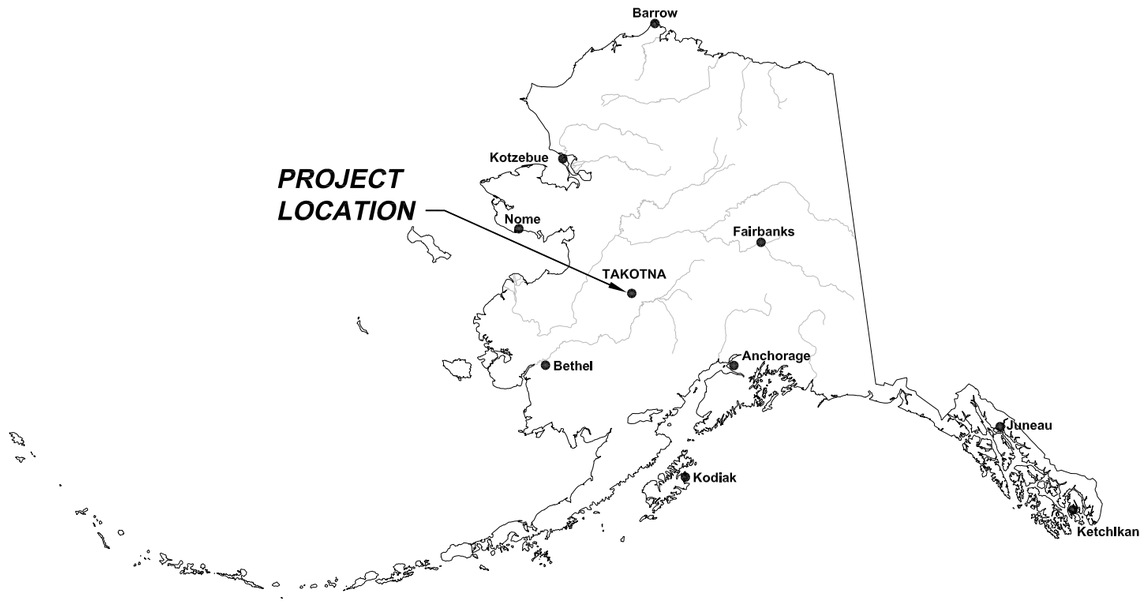
TAKOTNA TRIBAL COUNCIL

TAKOTNA WATER TREATMENT PLANT UPGRADE AND SEPTIC DRAINFIELD REPLACEMENT

TAKOTNA, ALASKA

35% DESIGN DRAWINGS
DECEMBER 16, 2013



INDEX TO DRAWINGS

CONSULTANTS

UMIAQ

6700 Arctic Spur Road · Anchorage, AK 99518 · (907)677-8220

CLIENT: VSM/TAKOTNA TRIBAL COUNCIL
PROJECT TITLE: TAKOTNA WASHETERIA FILTER AND SEPTIC
LOCATION: TAKOTNA, ALASKA
DOCUMENT TYPE: 35% DESIGN DOCUMENTS
ISSUE DATE: OCTOBER 03, 2013
PROJECT NO.: 70108.13

FILE: M:\Design\Engineering\PROJECTS\70108.13 Takotna Washeteria Filter and Septic\DESIGN\Drawings\CIVIL\70108.13 _Cover Sheet.dwg
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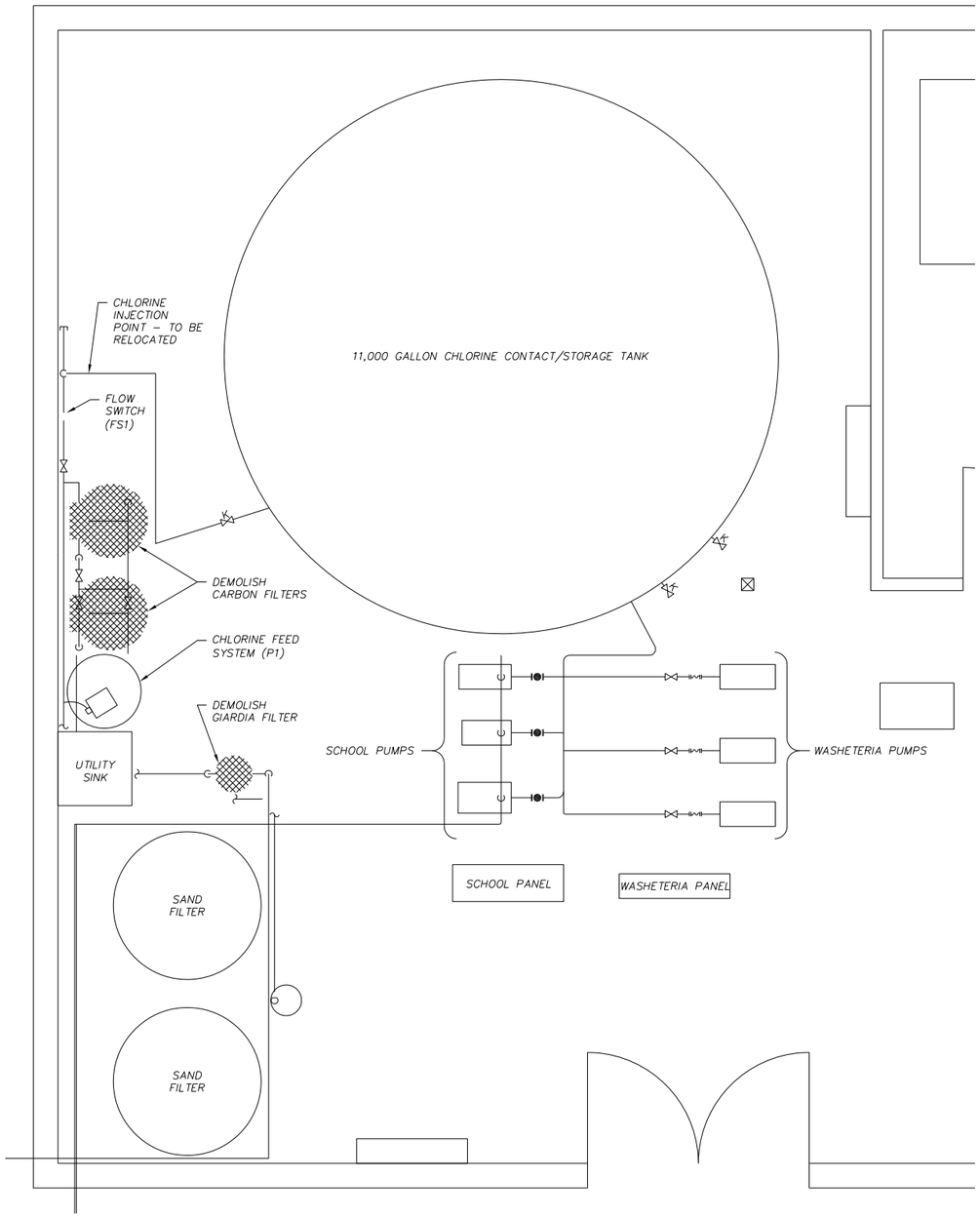
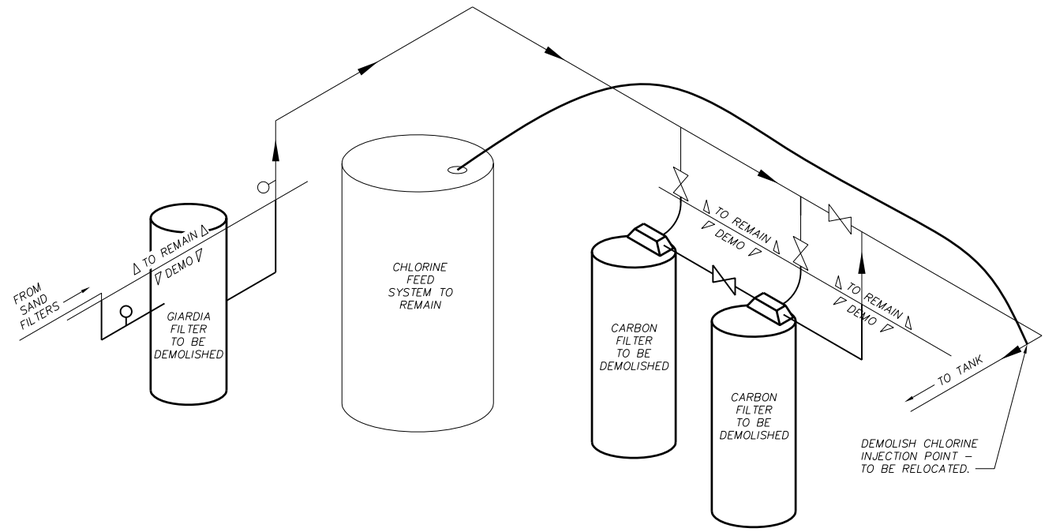


1 C-1 DEMOLITION PLAN

SCALE: N.T.S.

NOTES

1. OWNER: TAKOTNA COMMUNITY ASSOCIATION
   CONTACT: 888-856-6186
2. ELECTRIC UTILITY: TAKOTNA COMMUNITY ASSOCIATION INCORPORATED
   CONTACT: 888-856-6186
3. REMOVE EXISTING GIARDIA FILTER AND PRESSURE GAUGE.
4. REMOVE TWO EXISTING CARBON FILTER AND ASSOCIATED HARDWARE. VALVES FROM RAW WATER LINE TO REMAIN.
5. DO NOT REMOVE OR DAMAGE BACKWASH LINES OR VALVES.



2 C-1 DEMOLITION SCHEMATIC

SCALE: N.T.S.

TAKOTNA TRIBAL COUNCIL

WATER TREATMENT PLANT UPGRADE AND SEPTIC DRAINFIELD REPLACEMENT
TAKOTNA, ALASKA

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8700 Arctic Spur Road · Anchorage, AK 99518 (907)677-8320

35% DESIGN DRAWINGS

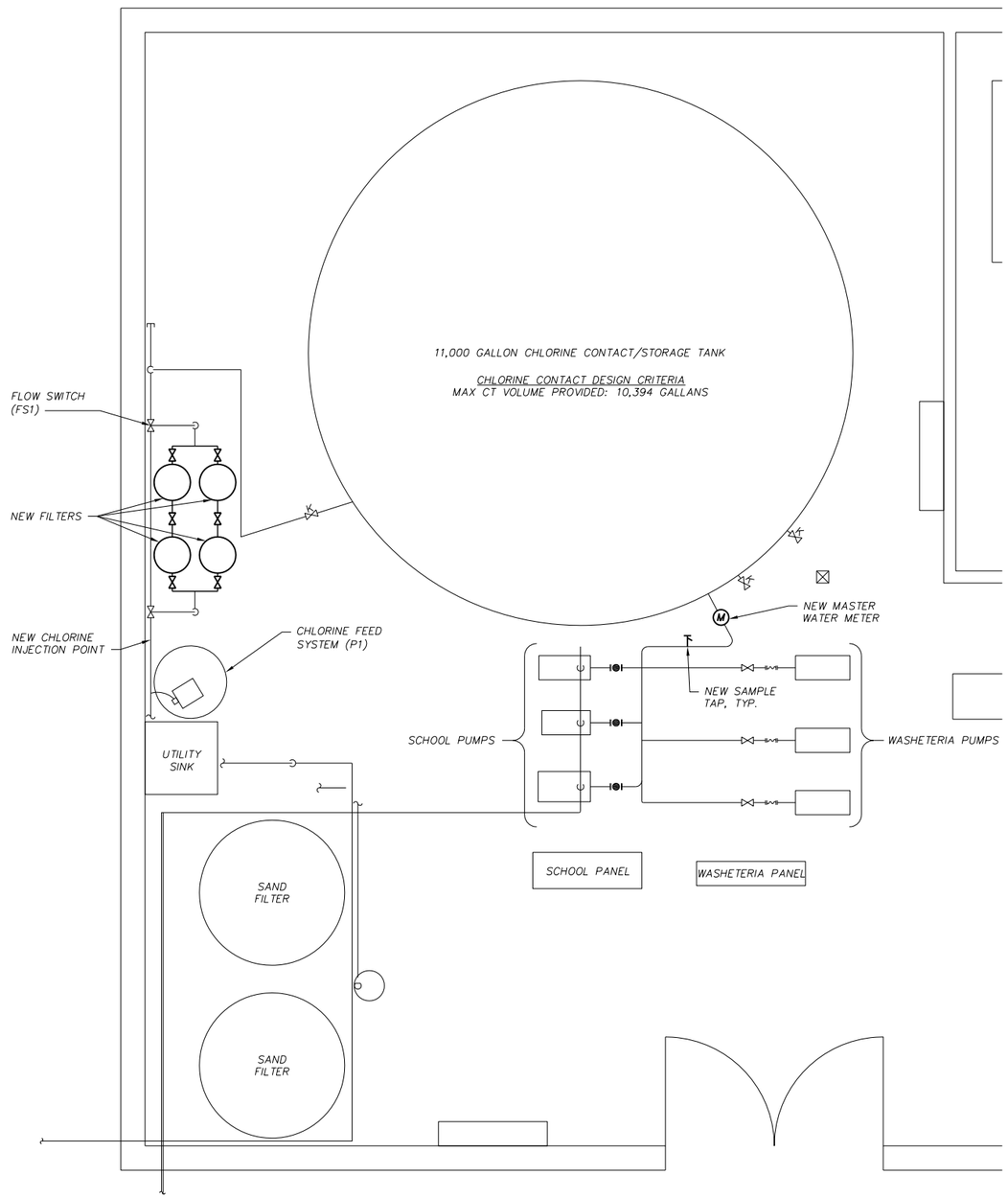
REVISIONS:

DRAWN BY: MAR
CHECKED BY: DH
DATE: 12/16/2013
JOB NUMBER: 70108.13
SCALE: AS SHOWN

DRAWING TITLE:
WASHETERIA
DEMOLITION PLAN

SHEET: OF
C-1

FILE: M:\Design\Engineering\PROJECTS\70108.13 Takotna Washeteria Filter and Septic\DESIGN\Drawings\CIVIL\70108.13 Washeteria Demo.dwg
PRINTED: 12/15/2013 18:44 David.Hardy LAYOUT: Layout 1



1 C-2 **WASHETERIA PLAN**
SCALE: N.T.S.

GENERAL NOTES

1. OWNER: TAKOTNA COMMUNITY ASSOCIATION
   CONTACT: 888-856-6186
2. ELECTRIC UTILITY: TAKOTNA COMMUNITY ASSOCIATION INCORPORATED
   CONTACT: 888-856-6186
3. ALL ADDITIVES AND MATERIALS USED FOR THE POTABLE WATER SYSTEM SHALL BE APPROVED FOR USE BY THE NATIONAL SANITATION FOUNDATION (NSF) STANDARDS, NSF 61, NSF 53, AS APPLICABLE..
4. ALL MATERIALS FOR THE POTABLE WATER SYSTEM SHALL BE LEAD-FREE. ONLY LEAD FREE PIPE, FLUX, AND SOLDER SHALL BE USED.
5. DESIGN DRAWINGS ARE SCHEMATIC IN NATURE, THEY ARE NOT INTENDED TO BE DETAILED DRAWINGS.
6. PROVIDE BACKFLOW AND CROSS CONNECTION CONTROL PER 18AAC80.
7. ALL PIPING MATERIALS TO BE SCHEDULE 40 PVC.

SCOPE OF WORK

1. DEMOLISH EXISTING GIARDIA FILTER AND CARBON FILTERS AS SHOWN ON SHEET C-1.
2. INSTALL STAGE ONE AND STAGE TWO FILTERS AND ASSOCIATED VALVES AND PIPING.
3. DISINFECT SYSTEMS AND DISPOSE OF NEUTRALIZED WATER PER THE REQUIREMENTS OF ANSI/AWWA C651, C652, C653. PRESSURE TESTING MAY BE CONDUCTED AT THE SAME TIME AS DISINFECTION PER ASNI/AWWA C605.
4. UPON COMPLETION OF WORK, PERFORM TOTAL COLIFORM TESTING PER ADEC REQUIREMENTS PRIOR TO ESTABLISHMENT OF SERVICE TO WATER SYSTEM.

SYMBOL LEGEND

EXISTING	PROPOSED
SAMPLE TAP	SAMPLE TAP
PRESSURE GAGE	PRESSURE GAGE
VALVE	VALVE
METER	METER
	FLOW DIRECTION

DESIGN CRITERIA

WATER SOURCE: SURFACE

POPULATION*:
CURRENT: 51
DESIGN: 51

PER CAPITA WATER USE*:
WATERING POINT: 19 GPCPD (RECENT)
WATER DISTRIBUTION: 25 GPCPD (RECOMMENDED)

AVERAGE DAILY DEMAND*:
CURRENT:
WASHETERIA: 950 GPD
SCHOOL: 627 GPD
TOTAL: 1,577 GPD

MAXIMUM DAILY DEMAND*:
CURRENT: 3,154 GPD

PEAK HOURLY DEMAND*:
CURRENT: 5.9 GPM (CURRENT MAXIMUM FILTRATION RATE: 7 GPM)

PEAK WATER DEMAND**:
CURRENT: 41.5 GPM

SOURCE PUMPING RATE*: 37 GPM

CT TREATMENT:
THE SYSTEM CAN MEET THE CT REQUIREMENTS FOR NORMAL AVERAGE AND PEAK FLOW RATES (12 GPM AND 45 GPM RESPECTIVELY). ASSUMING A WATER TEMPERATURE OF 5 DEGREES CELSIUS, BAFFLE FACTOR OF 10%, 0.5 LOG TREATMENT, pH OF 6.5, AND A MINIMUM WATER STORAGE CAPACITY OF 7,800 GALLONS, THE SYSTEM CAN ADJUST FREE CHLORINE RESIDUAL LEVELS TO MEET CT REQUIREMENTS. AT 5.5 GPM FLOW RATE, THE SYSTEM WOULD HAVE TO MAINTAIN 0.3 MG/L FREE CHLORINE RESIDUAL. AT 41.5 GPM FLOW RATES, THE SYSTEM WOULD HAVE TO MAINTAIN 1.2 MG/L FREE CHLORINE.

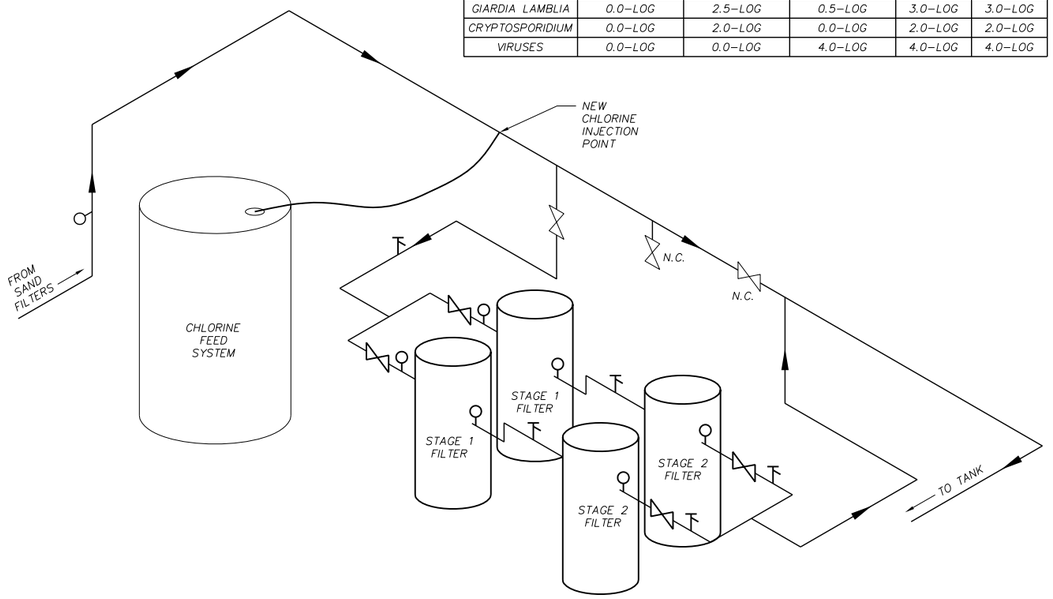
PRE-FILTERS:
SAND FILTERS ARE INSTALLED BEFORE THE PROPOSED STAGE 1 FILTERS TO REMOVE SILT AND LARGE PARTICLES PRIOR TO THE TREATMENT UNITS.

PROPOSED FILTERS:
STAGE 1:
TWO (2) MUNI-1-2FL-304 MUNICIPAL HURRICANE FILTRATION SYSTEM CARTRIDGES WITH HC/170-5 HURRICANE HIGH PERFORMANCE FILTERS MANUFACTURED BY HARMSCO MUNICIPAL, OR APPROVED EQUAL.

STAGE 2:
TWO (2) MUNI-1-2FL-304 MUNICIPAL HURRICANE FILTRATION SYSTEM CARTRIDGES WITH HC/170-LT2 HURRICANE ABSOLUTE RATED FILTERS MANUFACTURED BY HARMSCO MUNICIPAL OR APPROVED EQUAL.

* DATA FROM G.V. JONES WATER PLANT UPGRADE DESIGN - 1/6/2004
** DATA FROM FIXTURE COUNT CONDUCTED IN DECEMBER, 2013

TARGET PATHOGEN	SYSTEM AS DESIGNED				REQUIRED
	PRE-FILTERS (SAND FILTERS)	STAGE 1 & 2 FILTRATION	INACTIVATION (CHLORINATION)	TOTAL	
GIARDIA LAMBLIA	0.0-LOG	2.5-LOG	0.5-LOG	3.0-LOG	3.0-LOG
CRYPTOSPORIDIUM	0.0-LOG	2.0-LOG	0.0-LOG	2.0-LOG	2.0-LOG
VIRUSES	0.0-LOG	0.0-LOG	4.0-LOG	4.0-LOG	4.0-LOG



2 C-2 **WASHETERIA PIPING SCHEMATIC**
SCALE: N.T.S.

TAKOTNA TRIBAL COUNCIL

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REVISIONS:

DRAWN BY: DBH
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DATE: 12/16/2013
JOB NUMBER: 70108.13
SCALE: AS SHOWN

DRAWING TITLE:
WASHETERIA SITE PLAN, FLOW DIAGRAM AND GENERAL NOTES

SHEET: OF
C-2

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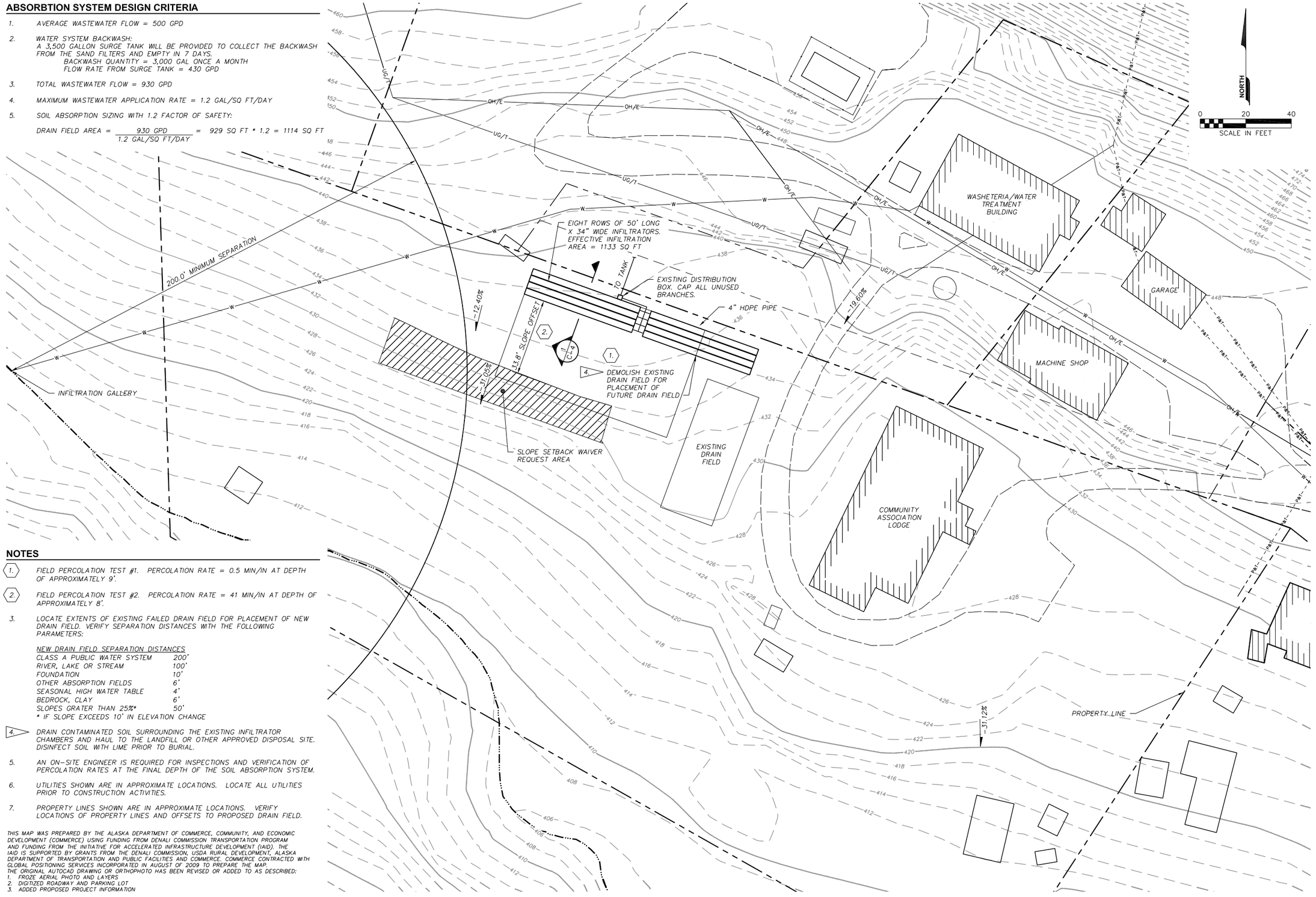
PRINTED: 12/15/2013 19:01 David.Hardy LAYOUT: Layout 1

ABSORBTION SYSTEM DESIGN CRITERIA

1. AVERAGE WASTEWATER FLOW = 500 GPD
2. WATER SYSTEM BACKWASH:
   A 3,500 GALLON SURGE TANK WILL BE PROVIDED TO COLLECT THE BACKWASH FROM THE SAND FILTERS AND EMPTY IN 7 DAYS.
   BACKWASH QUANTITY = 3,000 GAL ONCE A MONTH
   FLOW RATE FROM SURGE TANK = 430 GPD
3. TOTAL WASTEWATER FLOW = 930 GPD
4. MAXIMUM WASTEWATER APPLICATION RATE = 1.2 GAL/SQ FT/DAY
5. SOIL ABSORPTION SIZING WITH 1.2 FACTOR OF SAFETY:

   DRAIN FIELD AREA = $\frac{930\ GPD}{1.2\ GAL/SQ\ FT/DAY}$ = 929 SQ FT * 1.2 = 1114 SQ FT



NOTES

1. FIELD PERCOLATION TEST #1. PERCOLATION RATE = 0.5 MIN/IN AT DEPTH OF APPROXIMATELY 9'.
2. FIELD PERCOLATION TEST #2. PERCOLATION RATE = 41 MIN/IN AT DEPTH OF APPROXIMATELY 8'.
3. LOCATE EXTENTS OF EXISTING FAILED DRAIN FIELD FOR PLACEMENT OF NEW DRAIN FIELD. VERIFY SEPARATION DISTANCES WITH THE FOLLOWING PARAMETERS:

NEW DRAIN FIELD SEPARATION DISTANCES	
CLASS A PUBLIC WATER SYSTEM	200'
RIVER, LAKE OR STREAM	100'
FOUNDATION	10'
OTHER ABSORPTION FIELDS	6'
SEASONAL HIGH WATER TABLE	4'
BEDROCK, CLAY	6'
SLOPES GRATER THAN 25%*	50'

* IF SLOPE EXCEEDS 10' IN ELEVATION CHANGE

4. DRAIN CONTAMINATED SOIL SURROUNDING THE EXISTING INFILTRATOR CHAMBERS AND HAUL TO THE LANDFILL OR OTHER APPROVED DISPOSAL SITE. DISINFECT SOIL WITH LIME PRIOR TO BURIAL.
5. AN ON-SITE ENGINEER IS REQUIRED FOR INSPECTIONS AND VERIFICATION OF PERCOLATION RATES AT THE FINAL DEPTH OF THE SOIL ABSORPTION SYSTEM.
6. UTILITIES SHOWN ARE IN APPROXIMATE LOCATIONS. LOCATE ALL UTILITIES PRIOR TO CONSTRUCTION ACTIVITIES.
7. PROPERTY LINES SHOWN ARE IN APPROXIMATE LOCATIONS. VERIFY LOCATIONS OF PROPERTY LINES AND OFFSETS TO PROPOSED DRAIN FIELD.

THIS MAP WAS PREPARED BY THE ALASKA DEPARTMENT OF COMMERCE, COMMUNITY, AND ECONOMIC DEVELOPMENT (COMMERCE) USING FUNDING FROM DENALI COMMISSION TRANSPORTATION PROGRAM AND FUNDING FROM THE INITIATIVE FOR ACCELERATED INFRASTRUCTURE DEVELOPMENT (IAID). THE IAID IS SUPPORTED BY GRANTS FROM THE DENALI COMMISSION, USDA RURAL DEVELOPMENT, ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES AND COMMERCE. COMMERCE CONTRACTED WITH GLOBAL POSITIONING SERVICES INCORPORATED IN AUGUST OF 2009 TO PREPARE THE MAP. THE ORIGINAL AUTOCAD DRAWING OR ORTHOPHOTO HAS BEEN REVISED OR ADDED TO AS DESCRIBED:
1. FROZE AERIAL PHOTO AND LAYERS
2. DIGITIZED ROADWAY AND PARKING LOT
3. ADDED PROPOSED PROJECT INFORMATION

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DRAWN BY: DBH
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SCALE: AS SHOWN

DRAWING TITLE:
SEPTIC SITE PLAN

SHEET: 3 OF 4

C-3

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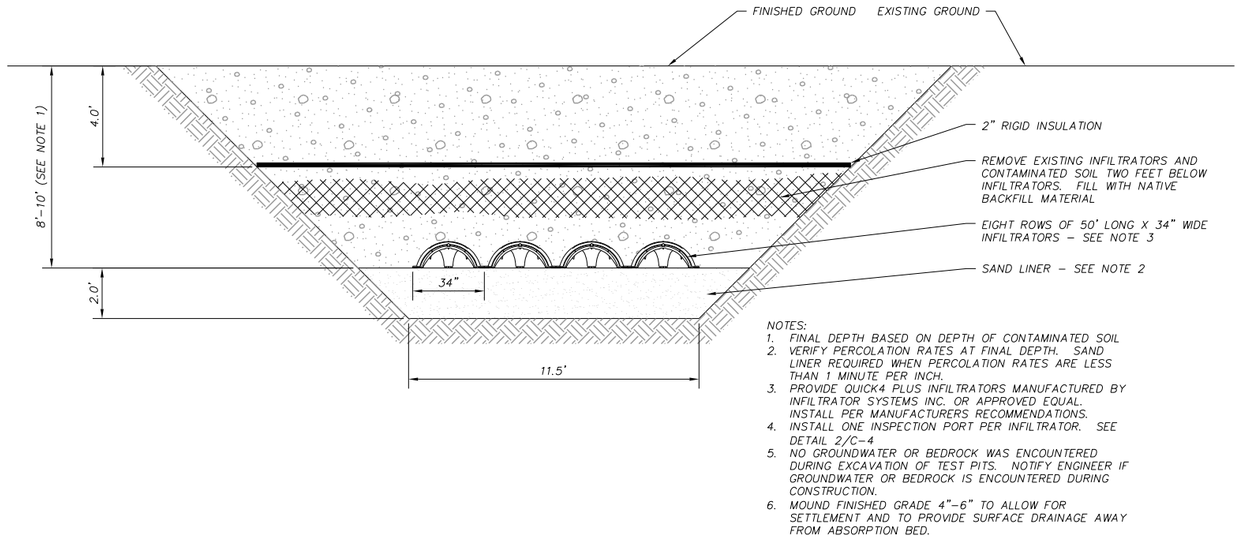
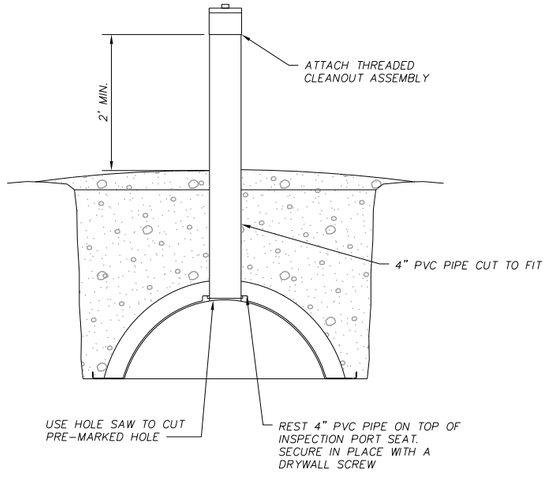


NOTES:
1. FINAL DEPTH BASED ON DEPTH OF CONTAMINATED SOIL
2. VERIFY PERCOLATION RATES AT FINAL DEPTH. SAND LINER REQUIRED WHEN PERCOLATION RATES ARE LESS THAN 1 MINUTE PER INCH.
3. PROVIDE QUICK4 PLUS INFILTRATORS MANUFACTURED BY INFILTRATOR SYSTEMS INC. OR APPROVED EQUAL. INSTALL PER MANUFACTURERS RECOMMENDATIONS.
4. INSTALL ONE INSPECTION PORT PER INFILTRATOR. SEE DETAIL 2/C-4
5. NO GROUNDWATER OR BEDROCK WAS ENCOUNTERED DURING EXCAVATION OF TEST PITS. NOTIFY ENGINEER IF GROUNDWATER OR BEDROCK IS ENCOUNTERED DURING CONSTRUCTION.
6. MOUND FINISHED GRADE 4"-6" TO ALLOW FOR SETTLEMENT AND TO PROVIDE SURFACE DRAINAGE AWAY FROM ABSORPTION BED.

1 C-4 DRAIN FIELD SECTION

SCALE: N.T.S.

NOTES:
1. PROVIDE CLEANOUT AT BOTH ENDS OF INFILTRATORS – 16 TOTAL.



2 C-4 INSPECTION PORT DETAIL

SCALE: N.T.S.

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DRAWING TITLE:
SEPTIC DETAILS

SHEET: 4 OF 4

C-4

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