**BID SCHEDULE**
**Mille Lacs INDIAN RESERVATION**
**INDIVIDUAL SEPTIC TANK AND MOUND**
**RICHARD HILL**

**BE-17-L02**

**SCHEDULE "B" INDIVIDUAL SEWER SYSTEM**

| ITEM NO. | DESCRIPTION | EST. QTY. | UNIT | UNIT COST | | TOTAL COST |
|---|---|---|---|---|---|---|
| 1 | 1500 Gallon Combo Septic Tank | 1 | Each | $ | | $ |
| 2 | 1000 Gallon Septic Tank | 1 | Each | $ | | $ |
| 3 | 1000 Gallon Pump Tank | 1 | Each | $ | | $ |
| 4 | 4-inch solid PVC Pipe | 50 | Feet | $ | | $ |
| 5 | Two-way Cleanout | 1 | Each | $ | | $ |
| 6 | Effluent Pump and Controls | 1 | Each | $ | | $ |
| 7 | Electric Cable | 50 | Feet | $ | | $ |
| 8 | 2-inch Schedule 40 Solid PVC Effluent Pipe | 30 | Feet | $ | | $ |
| 9 | Mound System | 1 | LS | $ | | $ |
| 10 | Existing Tank and Mound Removal | 1 | LS | $ | | $ |
| 11 | ISTS Permit | 1 | Each | $ | | $ |
| 12 | Construction Incidentals | 1 | LS | $ | | $ |

**Total Schedule "B"** $ _____

_____
Contractor's Authorized Signature


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# Application for SSTS Permit

MILLE LACS COUNTY EST 11857

**INSTRUCTIONS**

Before you apply for a SSTS Permit, all property taxes must be current. Please complete this application in full. Incomplete or incorrect applications will be returned to the applicant. The application and required submittal documents may be submitted in person or mailed to:

Mille Lacs County Environmental Resources
635 2nd Street SE
Milaca, MN 56353

## APPLICANT INFORMATION

Name: HILL/RICHARD Contact Phone: _____

Mailing Address: 31972 115TH AVE ONAMIA

E-mail Address: _____

Are you purchasing the property on a Contract for Deed? ☐ Y ☐ N

If yes, please have the Contract Holder sign here: _____

Are you an agent acting on behalf of the landowner? ☐ Y ☐ N

If yes, please have the landowner sign here: _____

## SSTS PROFESSIONAL INFORMATION

Installer Name: _____ Installer Phone: _____

Installer Email Address: _____ Installer License #: _____

Designer Name: R&R SEPTIC Designer Phone: 320-339-1890

Designer Email Address: RSTRAKA@HOTMAIL.COM Designer License #: L2846

## PROPERTY INFORMATION

Property Owner: ~~Hill~~ HILL/RICHARD

Property Address: 31972 115TH AVE ONAMIA Dwelling Type: HOUSE

Parcel ID Number: 14-029-0200 # Bedrooms: 5 Flow: 750

Is the property located within 1,000 feet of a lake or 300 feet of a river? ☐ Y ☒ N

# Application for SSTS Permit

MILLE LACS COUNTY ESTH1857

## SYSTEM INFORMATION

| | | | |
|---|---|---|---|
| Installation Type: | ☐ New ☒ Replacement ☐ Upgrade | | |
| Septic Tank Capacity: | 1500c & 1000 | Pump Tank Capacity: | 1000 |
| Sewage Pump: | ☒ Yes ☐ No | Garbage Disposal: | ☐ Yes ☒ No |
| Pressure Test: | ☐ Yes ☒ No | Filter/Alarm: | ☐ Yes ☒ No |
| Well Setback: | 50'+ | Well Type: | ☒ Deep ☐ Shallow |
| Building Setback: | 10'+ | OHWM Setback: | NA |
| Property Line Setback: | 10'+ | Road Setback: | 50'+ |
| System Type: | ☐ Type I ☐ Type II ☐ Type III ☐ Type IV ☐ Type V | | |
| Drainfield Type: | mound | Drainfield Size (sq ft): | 41x93 |
| Restrictive Layer (in): | 12" | Sand Lift (in): | 36" |
| Well Setback: | 50'+ | Well Type: | ☒ Deep ☐ Shallow |
| Building Setback: | 20'+ | OHWM Setback: | NA |
| Property Line Setback: | 10'+ | Road Setback: | 10'+ |

## APPLICATION SUBMITTAL REQUIREMENTS

- ☐ Management Plan.
- ☐ Soil Verification Form(s).
  - Percolation test required if a soil pit is not utilized.
- ☐ Site Map:
  - Elevations of tanks and soil treatment system.
  - Setbacks to buildings, property lines, water bodies, and wells.
  - Soil borings and/or pits identified.
  - Distance between tank and soil treatment system.
- ☐ Type II Holding Tank Service Agreement, if applicable.
- ☐ Type IV and V Operating Permit, as applicable.
- ☐ Homeowner-Installed System Indemnification Agreement Form, as applicable.
- ☐ Permit fee, based on system and/or permit type, payable by cash, check, or credit card:
  - $250 Standard System
  - $100 Tank Only
  - $150 Holding Tank
  - $50 System Repair
  - $150 Soil Treatment System Only
  - $1,200 - $2,000 Performance System or MSTS (*Call for permit cost)*
- ☐ Plumbing Permit fee of $31.95 payable by cash, check, or credit card, if installing new tank.
- ☐ MPCA Compliance Inspection Form for Existing SSTS, if reusing existing tank.



Mille Lacs County Environmental Resources, 635 2nd Street SE, Milaca, MN 56353
320-983-8458 • www.millelacs.mn.gov

## Application for SSTS Permit

MILLE LACS COUNTY EST. 1857

**TERMS AND CONDITIONS**

The information in this application and submitted materials are true and correct to the best of my knowledge. I agree that all work will comply with all applicable federal and state regulations, the documents contained herein, and the Mille Lacs County Subsurface Sewage Treatment System Ordinance. I also agree to allow Mille Lacs County staff to enter the property during normal business hours to conduct tests and inspections as may be needed to process the application.

_____ _____

Signature of Applicant/Owner Date

I hereby certify that I am a currently licensed SSTS designer certified to design this system, that I have followed all requirements of state administrative rules and the Mille Lacs County Subsurface Sewage Treatment System Ordinance, and that the number of bedrooms identified is true and correct.

_____ 8/1/20

Signature of Designer Date

***OFFICE USE ONLY***

Date Application Received: _____ Taxes Verified as Current: ☐ Y ☐ N

Building Permit # (air test): _____ Any Violations on Property: ☐ Y ☐ N

Ownership Verified: ☐ Y ☐ N Submitted with Building Permit: ☐ Y ☐ N

Date Staff Approved Application as Complete: _____

☐ Ownership

☐ Setbacks Soil Verification Date: _____

☐ Floodplain Permit Approved Date: _____

☐ Wetlands Permit Number: _____

☐ Public Waters LSO Notification Date: _____

☐ Soils Verified Reviewer Initials: _____

Notes:

_____

_____

_____

_____



Mille Lacs County Environmental Resources, 635 2nd Street SE, Milaca, MN 56353
320-983-8458 • www.millelacs.mn.gov

MILLE LACS COUNTY EST. 1857

# Parcel Report

Parcel Number: 14-029-0200

## General Information

**Township/City:** ONAMIA TWP
**Taxpayer Name:** HILL/RICHARD
**Taxpayer Address:** 31972 115TH AVE
ONAMIA MN 56359

**Property Address:** 31972 115TH AVE
**Township:** 41
**Range:** 26
**Section:** 29
**Plat:** 0 -
**Acres:** 0.85
**Legal Description:** N 208.7 FT OF W 208.7 FT OF NW OF NE EX W 2 RDS 29 41 26 .85
**Rural Service District:** 0
**Tax Increment:** No
**School District:** 480 - ONAMIA SCHOOL DIST

## Tax Information

**Class:** RESIDENTIAL\SINGLE UNIT
**Homestead:** FULL HOMESTEAD

---

CONSTRUCTION NOTE:

(1) GRINDER PUMP IN BASEMENT

(2) VERIFY THAT HOUSE DRAIN TILE OUTLETS TO SUMP BASKET NOT TO GRINDER PUMP.

(3) CONSTRUCT TEMP DRIVEWAY EXISTING PAVED DRIVEWAY CANNOT BE USED.

2011 purple code

# Mound Design

www.SepticResource.com (vers 19.2)

Property Owner: HILL/RICHARD Date: 8/1/20

Site Address: 31952 115TH AVE PID: 14-029-0200

Comments: ONAMIA MN

instructions: [ ] = enter data [ ] = adjust if desired [ ] = computer calculated - DO NOT CHANGE!

1) 5 bedroom Type 1 Residential System

2) 750 GPD design flow

3) No Garbage disposal or pumped to septic

4) 1500 Gal Septic tank (code minimum) 1500 Gal Septic tank (design size / LUG req'd)
Tank options: none

5) 1.2 GPD/ft$^2$ mound sand loading rate contour loading rate of 12 req's a min 62.5 ft. long rockbed

6) 10.0 ft rockbed width 62.5 ft rockbed length

7) 3.0 ft lateral spacing 3.0 ft perforation spacing (maximum of 3 for both)
end feed manifold connection

8) 3 laterals 60.5 feet long 21.0 perfs / lateral 63 perfs total
(1/2 a perf means the first perf starts at the middle feed manifold)

9) 1/4" inch perfs at 1 feet residual head gives 0.74 gpm flow rate per perforation

for this perf size & spacing, & pipe size on line 12, max perfs/lateral = 25, line #8 must be less --> OK

10) 4.0 doses per day ( 4 minimum)

11) 188 gallons per dose (treatment volume)

12) 2.00 inch diameter laterals must be used to meet "4x pipe volume" requirement

13) 10 feet of 2.0 inch supply line leads to 2 gallons of drainback volume
(Tip: "top feed" manifold to control the drainback)

14) 190 gallons TOTAL pump out volume (treatment + drainback)

15) 9 feet vertical lift from pump to mound laterals, leads to a:

16) 47 GPM @ 15 feet of head, Pump requirement (note: >50gpm may require an extra 3-6' of head)

17) 750 gal Dose tank (code minimum) 1000 gal Dose tank (design size / LUG req'd) at 23.00 gpi
leads to a: Optional Time dosing of:

18) 8.3 inch swing on Demand float, (this delivers Average flow, =70% of Peak design flow)

4 min ON

19) 12 inches from bottom of tank to "Pump OFF" float 8.5 hrs OFF

20) 20 inches from bottom of tank to "Pump ON" float 12 inches to "Timer ON" float

21) 23 inches from bottom of tank to "Hi Level" float 33 inches to "Hi Level" float

22) 471 gallons reserve capacity (after High Level Alarm is activated-demand dosed)

23) 0.60 gpd/ft² Absorption area Soil Loading Rate, which gives a mound ratio of 2 (minimum)
(this must match the soil boring log) desired mound ratio 2.0

24) 1 percent site slope (0-20% range) 1 (% downslope site slope, if different than upslope)

25) 0 inches, or 0.0 ft. to Redox or other limiting condition (need at least 12" to be a Type I)
Treatment zone contains 0 inches of 0% soil credit, and 0 inches of 50% soil credit. Giving a:

26) 36 inch, or 3.0 ft. Sand Lift Mound **CRITICAL FOR FUTURE CERTIFICATIONS!!!**

27) 20.0 ft.Total ABSORPTION width (with sand beyond rockbed as follows:)

28) 5.0 ft. upslope and sideslope
5.0 ft. Downslope

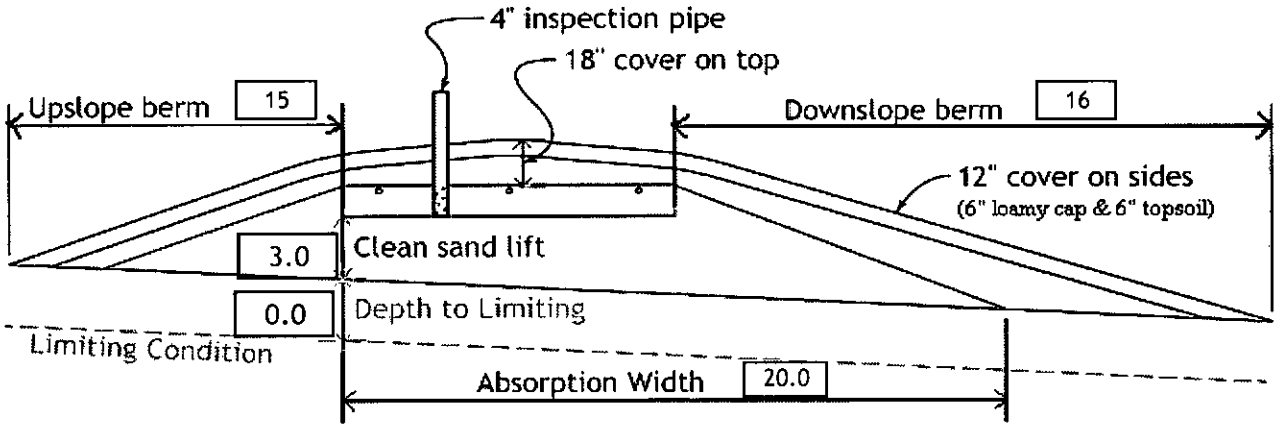
Individual slope ratios give BERM widths (topsoil beyond rockbed) of:

29) 3:1 upslope ratio 15 ft. upslope berm

30) 3:1 sideslope 15 ft. sideslope berms

31) 3:1 downslope 16 ft. downslope berm

32) Overall Dimensions: 10.0 ft. wide by 62.5 ft. long Rock bed
41 ft. wide by 93 ft. long Mound footprint




Note:
For 0 to 1% slopes, *Absorption Width* is measured from the *Bed* equally in both directions.
For slopes >1%, *Absorption Width* is measured downhill from the upslope edge of the *Bed*.

33) Rock Bed:
10.0 ft. by 62.5 ft. by 9 inches under pipe, plus 20% gives 28 yd³ or *1.4= 39 ton

34) Mound Sand: (note: volume is based on 3:1/4:1 slope from top of rockbed, Exchange sand for loamy cap if desired)
74.6 up + 83.2 downslope + 18.7 ends + 70.6 under rock = 296 yd³ or *1.4= 415 ton
plus 20%

35) Loamy Cap:
37 ft. by 89 ft. 6" deep, plus 20% gives 73 yd³ or *1.4= 102 ton

36) Topsoil:
41 ft. by 93 ft. 6" deep, plus 20% gives 85 yd³ or *1.4= 119 ton

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

| Designer Signature | Company | License# | Date |
|---|---|---|---|
| RS | R&R SEPTIC | L2846 | 8/1/20 ~~1/0/1900~~ |

# Installer Summary

1500 gallon Septic tank (minimum) Tank options: none

1000 gallon Dose tank (minimum) at 23.00 gpi

47 GPM @ 15 ft. of head, Pump required

8.3 inch swing on Demand float which translates to roughly 5.2 inches of float tether length

Optional Time dosing of:

4 minutes ON

8.5 hours OFF

20 inches from bottom of tank to "pump ON" float, or

23 inches from bottom of tank to "Hi Level Alarm" or

12 inches to "timer ON" float

33 inches to "Hi level" float

10 ft. of 2.0 inch supply line with end feed manifold connection

(Tip: "top feed" manifold to control drainback)

36 inch, or 3.0 ft. Sand Lift Mound

10.0 ft. wide by 62.5 ft. long Rock bed

3 laterals 2.00 inch diameter 60.5 ft. long 3.0 ft. lateral spacing

1/4" inch perfs 3.0 ft. perforation spacing

No Effluent filter & alarm

3 clean out & valve box assemblies

20.0 ft.Total sand ABSORPTION width (minimum)

5.0 ft. upslope and sideslope (sand beyond rockbed, minimum)

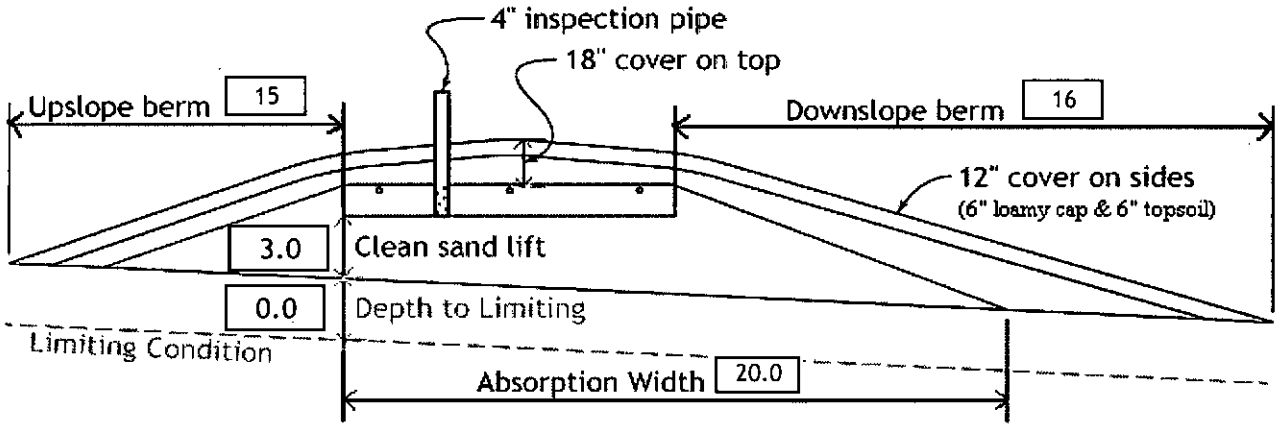
5.0 ft. Downslope (sand beyond rockbed, minimum)

Specific slope ratios give BERM widths (topsoil beyond rockbed) of:

3:1 upslope ratio 15 ft. upslope berm

3:1 sideslope 15 ft. sideslope berms

3:1 downslope 16 ft. downslope berm




Note:
For 0 to 1% slopes, *Absorption Width* is measured from the *Bed* equally in both directions.
For slopes >1%, *Absorption Width* is measured downhill from the upslope edge of the *Bed*.

| | | | | | |
|---|---|---|---|---|---|
| Rock Bed: | 28.0 | $yd^3$ or *1.4= | 39 | ton | 9 inches under pipe |
| Mound Sand: | 296 | $yd^3$ or *1.4= | 415 | ton | calculation based on 3:1/4:1 slope from top of rockbe |
| Loamy Cap: | 73 | $yd^3$ or *1.4= | 102 | ton | 6" deep |
| Topsoil: | 85 | $yd^3$ or *1.4= | 119 | ton | 6" deep |

# INSPECTOR CHECKLIST - mound

U

☐ WELL setbacks: 20'- 50' to sewer line req's MDH pressure test form (5 psi for 15 min).
50' to everything 100' to drainfield with shallow well

☐ PROPERTY LINES setback: 10' to everything

☐ Road setback: platted: 10' prop line. Metes & bounds: out of road easement, or outer ditch.

☐ LAKE / BLUFF setback: 20' for bluff. Lakes: GD ___, RD ___, NE ____. Protected wetland ___.

☐ Building setbacks: 10' for everything, 20' for dispersal area.

☐ WATER LINE under pressure 10' to bed,tank & sewer line. (else sewer line > 12" below)

☐ Sewer line & tank connection (no hard 90's, long sweep 90 or 2-45's, slope minimum 1" in 8' = 1%)
(no depth req's, clean out every 100', Sch 40 pipe)

☐ Septic tank and risers (water tight risers, baffles, insulated, proper depth, existing verified by pumping)
mfg_____ 1500 gallons none

☐ Riser over outlet, riser over inlet or center, and 6"+ inspection pipe over any remaining baffles.

☐ No effluent filter & alarm

☐ Dose tank, risers and piping (water tight risers, insulated, proper depth, drainback)
mfg_____ 1000 gallons

Optional Time dosing of:
4 min ON 8.5 hr OFF

☐ dose pump _____ 47 gpm 15 head VERIFY PUMP CURVE

☐ verify that installed "vertical lift from pump to laterals" is no more than design value of 9 feet

☐ float setting drop 8.3 inches at 23.0 gpi "DESIGNED" 5.2 inches approx float tether length
190.0 gal dose divided by _____ gpi "INSTALLED" = _____ inches float drop (field corrected

LABEL pump requirements and drawdown on riser or panel

☐ Cam lock reachable from grade - 30" max. J-hook weep hole. Supply line access (no hard 90's)

☐ 2.0 inch supply pipe: Sch40, sloped 1/8"+, supported by 4" sch40 sleeve or compacted, and buried 6"+.

☐ splice box / control panel / electrical connections

☐ flow measurement: CT, ETM, time dosed, home water meter

☐ mound absorption area rough up

☐ mound rock dimensions 10.0 X 62.5

☐ Sand lift depth 36 inches. (Jar test : 2" sand leaves < 1/8" silt after 30 min)

☐ Absorption Sand beyond rock 5.0 upslope 5.0 downslope

☐ Bermed topsoil beyond rockbed 15 upslope 15 sideslope 16 downslope

☐ cover depth of 12-18"+ VERIFY

☐ 3 laterals (1-2' from edge of rock)

☐ 2.00 inch pipe size (Sch40 pipe & fittings)

☐ 3.0 ft lateral spacing

☐ 1/4" inch perforations

☐ 3.0 ft perforation spacing

☐ Air inlet at end of laterals, and at top feed manifold if necessary. VERIFY

☐ clean outs (no hard 90's)

☐ 4" inspection pipe to bottom of rock, anchored VERIFY

☐ Abandon existing system - if necessary ☐ Re-use existing tank certification

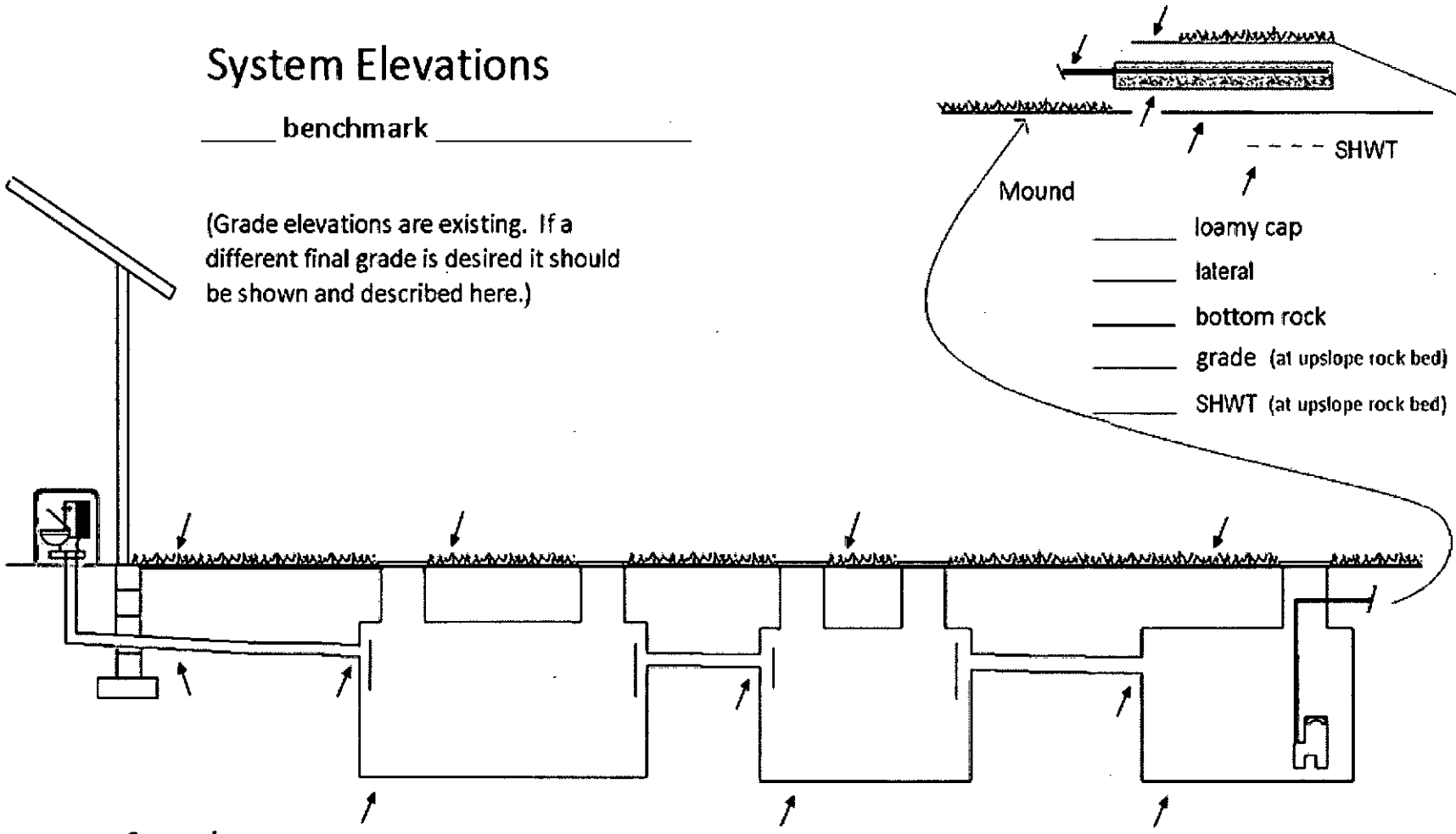
☐ monitoring plan and type _____

☐ well abandonment form - if necessary

# System Elevations

_____ benchmark _____

(Grade elevations are existing. If a different final grade is desired it should be shown and described here.)




Sewer pipe exiting house

_____ Grade

_____ Pipe

Septic Tank

_____ Grade

_____ inlet

_____ Tank bottom

Septic Tank (if applicable)

_____ Grade

_____ inlet

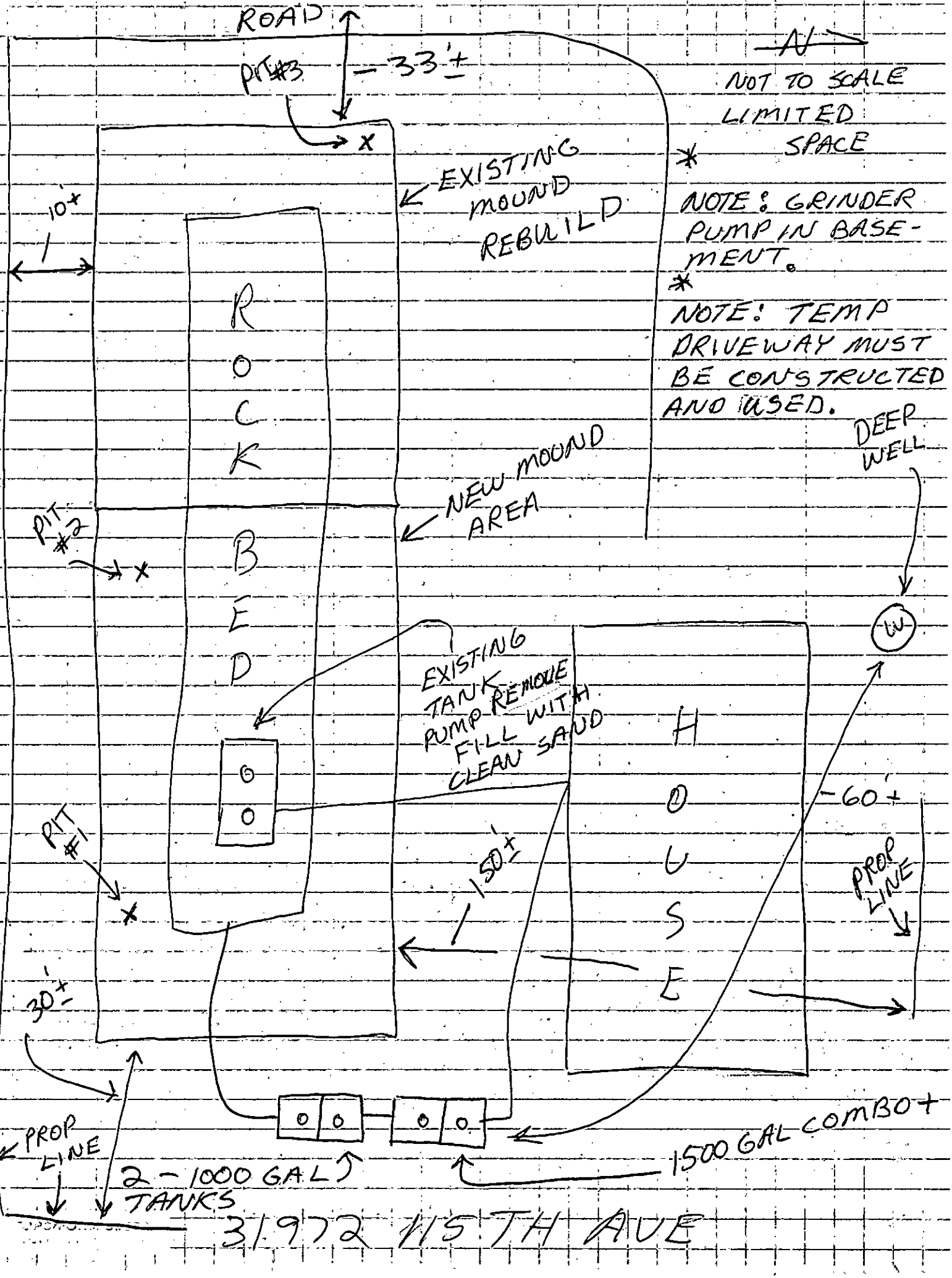
_____ Tank bottom

Pump Tank

_____ Grade

_____ inlet

_____ Tank bottom


ROAD
PIT #3
~33'±
X
N
NOT TO SCALE
LIMITED SPACE
EXISTING MOUND REBUILD
10'±
ROCK
NEW MOUND AREA
NOTE: GRINDER PUMP IN BASEMENT.
NOTE: TEMP DRIVEWAY MUST BE CONSTRUCTED AND USED.
DEEP WELL
PIT #2
BED
EXISTING TANK PUMP REMOVE FILL WITH CLEAN SAND
HOUSE
PIT #1
150'±
~60'±
PROP LINE
30'±
PROP LINE
2 - 1000 GAL TANKS
1500 GAL COMBO+
31972 11 5TH AVE

# U of MN Onsite Sewage Treatment Program Soil Boring Log

**Client/ Address:** 31972 115TH AVE ONAMIA **Legal Description/GPS:** **Date:** 8/1/20

**Soil Parent Material(s):** (circle all that apply) Till Outwash Lacustrine Alluvium Loess Organic Matter Bedrock

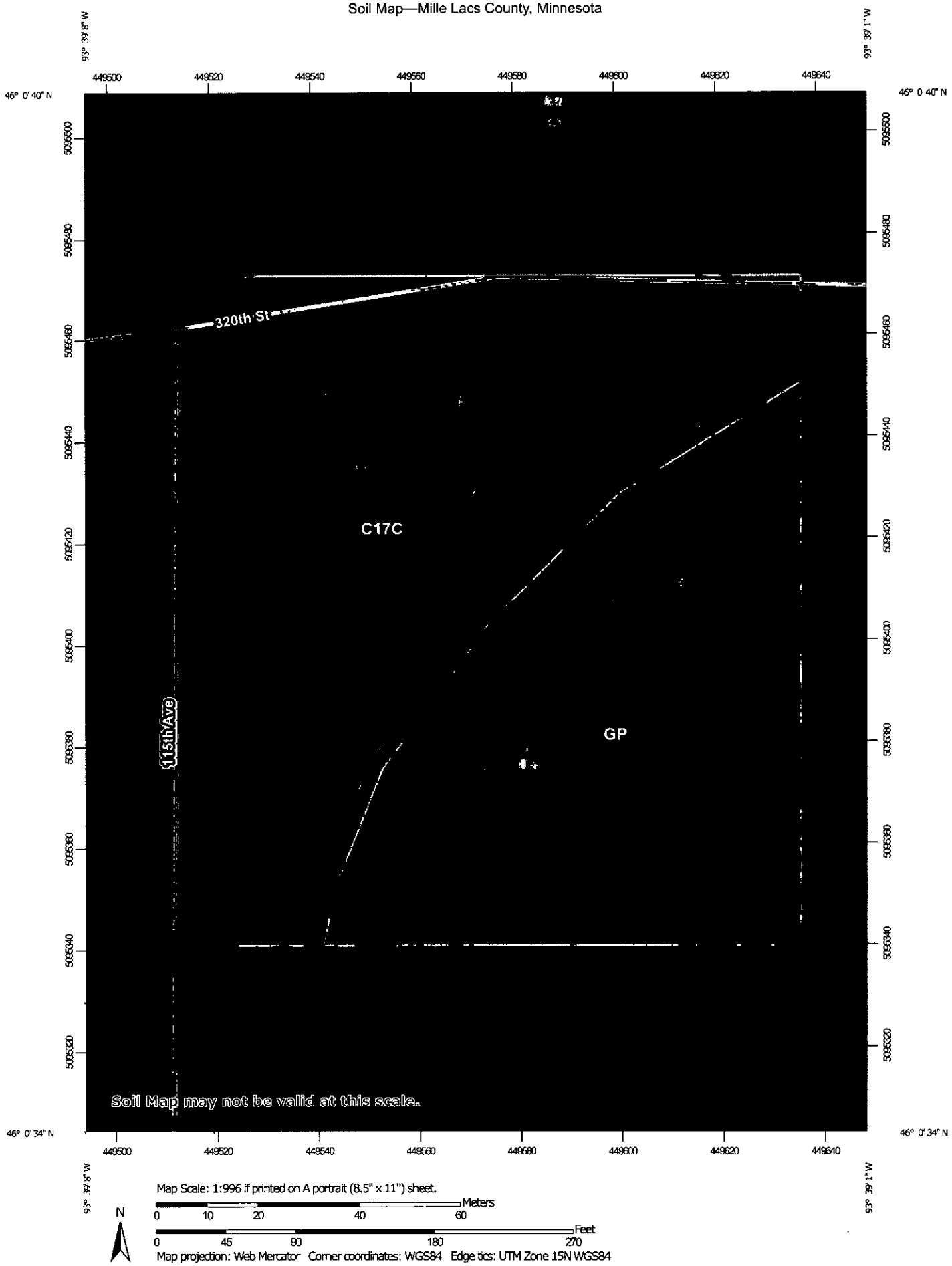
**Landscape Position:** (circle one) Summit Shoulder Back/Side Slope Foot Slope Toe Slope

**Vegetation:** LAWN **Soil Survey Map Unit(s):** **Slope (%):** 1%

**Weather conditions/Time of Day:** **Slope Shape:**

| | Depth (in) | Texture | Matrix Color(s) | Mottle Color(s) | Redox Kind(s) | Saturated Soil Indicator(s) (see back) | I---------- Structure----------I Shape | Grade | Consistence |
|---|---|---|---|---|---|---|---|---|---|
| PIT #1 | 0-12" | LOAM | 4/2 10YR | | Concentrations Depletions Gleyed | | Granular Platy Blocky Prismatic Single Grain Massive | Weak Moderate Strong Loose | Loose Friable Firm Extremely Firm Rigid |
| | 12" | FINE SANDY LOAM | 5/4 10YR | 5/8 10YR | Concentrations Depletions Gleyed | 12" | Granular Platy Blocky Prismatic Single Grain Massive | Weak Moderate Strong Loose | Loose Friable Firm Extremely Firm Rigid |
| PIT #2 | 0-11" | LOAM | 4/2 10YR | | Concentrations Depletions Gleyed | | Granular Platy Blocky Prismatic Single Grain Massive | Weak Moderate Strong Loose | Loose Friable Firm Extremely Firm Rigid |
| | 11"-18" | FINE SANDY LOAM | 5/4 10YR | 5/8 10YR | Concentrations Depletions Gleyed | 18" | Granular Platy Blocky Prismatic Single Grain Massive | Weak Moderate Strong Loose | Loose Friable Firm Extremely Firm Rigid |
| PIT #3 | 0-10" | LOAM | 4/2 10YR | | Concentrations Depletions Gleyed | | Granular Platy Blocky Prismatic Single Grain Massive | Weak Moderate Strong Loose | Loose Friable Firm Extremely Firm Rigid |
| | 10"-16" | FINE SANDY LOAM | 5/4 10YR | 5/8 10YR | Concentrations Depletions Gleyed | 16" | Granular Platy Blocky Prismatic Single Grain Massive | Weak Moderate Strong Loose | Loose Friable Firm Extremely Firm Rigid |

**Comments:**




Map Scale: 1:996 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 45 90 180 270

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**

- Streams and Canals

**Transportation**

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**

- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mille Lacs County, Minnesota
Survey Area Data: Version 15, Jun 4, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 19, 2014—Oct 6, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| C17C | Rosholt-Chetek complex, 8 to 15 percent slopes | 2.5 | 59.8% |
| GP | Pits, gravel-Udipsamments complex | 1.7 | 40.2% |
| **Totals for Area of Interest** | | **4.2** | **100.0%** |

# Mille Lacs County, Minnesota

## C17C—Rosholt-Chetek complex, 8 to 15 percent slopes

### Map Unit Setting

*National map unit symbol:* 1t8d7
*Elevation:* 980 to 1,640 feet
*Mean annual precipitation:* 25 to 30 inches
*Mean annual air temperature:* 39 to 45 degrees F
*Frost-free period:* 120 to 140 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Rosholt and similar soils:* 55 percent
*Chetek and similar soils:* 30 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Rosholt

#### Setting

*Landform:* Stream terraces, outwash plains
*Landform position (two-dimensional):* Summit, backslope, shoulder
*Down-slope shape:* Convex
*Across-slope shape:* Linear
*Parent material:* Outwash

#### Typical profile

*Ap - 0 to 8 inches:* loam
*B/E - 8 to 12 inches:* fine sandy loam
*Bt - 12 to 28 inches:* loam
*2BC - 28 to 32 inches:* loamy sand
*2C - 32 to 80 inches:* gravelly coarse sand

#### Properties and qualities

*Slope:* 8 to 15 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 2.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Low (about 5.5 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 4e
*Hydrologic Soil Group:* B
*Forage suitability group:* Sloping Upland, Low AWC, Acid (G090XN008MN)

*Other vegetative classification:* Sloping Upland, Low AWC, Acid (G090XN008MN)
*Hydric soil rating:* No

### Description of Chetek

#### Setting

*Landform:* Stream terraces, outwash plains
*Landform position (two-dimensional):* Backslope, shoulder, summit
*Down-slope shape:* Convex
*Across-slope shape:* Linear
*Parent material:* Outwash

#### Typical profile

*Ap - 0 to 5 inches:* fine sandy loam
*E - 5 to 12 inches:* fine sandy loam
*Bt1 - 12 to 18 inches:* sandy loam
*2Bt2 - 18 to 25 inches:* gravelly loamy coarse sand
*2BC, 2C - 25 to 80 inches:* gravelly coarse sand

#### Properties and qualities

*Slope:* 8 to 15 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat excessively drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 6.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Low (about 3.7 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 6s
*Hydrologic Soil Group:* A
*Forage suitability group:* Sandy (G090XN022MN)
*Other vegetative classification:* Sandy (G090XN022MN)
*Hydric soil rating:* No

### Minor Components

#### Antigo

*Percent of map unit:* 10 percent
*Landform:* Stream terraces, outwash plains
*Landform position (two-dimensional):* Summit, backslope
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Other vegetative classification:* Sloping Upland, Acid (G090XN006MN)
*Hydric soil rating:* No

#### Mahtomedi

*Percent of map unit:* 5 percent
*Landform:* Stream terraces, outwash plains

*Landform position (two-dimensional):* Backslope, shoulder, summit
*Down-slope shape:* Convex
*Across-slope shape:* Linear
*Other vegetative classification:* Sandy (G090XN022MN)
*Hydric soil rating:* No

## Data Source Information

Soil Survey Area: Mille Lacs County, Minnesota
Survey Area Data: Version 15, Jun 4, 2020

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# Septic System Management Plan for Above Grade Systems

The goal of a septic system is to protect human health and the environment by properly treating wastewater before returning it to the environment. Your septic system is designed to kill harmful organisms and remove pollutants before the water is recycled back into our lakes, streams and groundwater.

This **management plan** will identify the operation and maintenance activities necessary to ensure long-term performance of your septic system. Some of these activities must be performed by you, the homeowner. Other tasks must be performed by a licensed septic maintainer or service provider. However, it is **YOUR** responsibility to make sure all tasks get accomplished in a timely manner.

The University of Minnesota's *Septic System Owner's Guide* contains additional tips and recommendations designed to extend the effective life of your system and save you money over time.

***Proper septic system design, installation, operation and maintenance means safe and clean water!***

Property Owner HILL / RICHARD Email

Property Address 31972 115TH AVE Property ID 14-029-0200

System Designer R&R SEPTIC Contact Info

System Installer Contact Info

Service Provider/Maintainer Contact Info

Permitting Authority MILLE LACS COUNTY Contact Info

Permit # Date Inspected

Keep this Management Plan with your Septic System Owner's Guide. The Septic System Owner's Guide includes a folder to hold maintenance records including pumping, inspection and evaluation reports. Ask your septic professional to also:

- Attach permit information, designer drawings and as-built of your system, if they are available.
- Keep copies of all pumping records and other maintenance and repair invoices with this document.
- Review this document with your maintenance professional at each visit; discuss any changes in product use, activities, or water-use appliances.

For a copy of the *Septic System Owner's Guide*, visit www.bookstores.umn.edu and search for the word "septic" or call 800-322-8642.

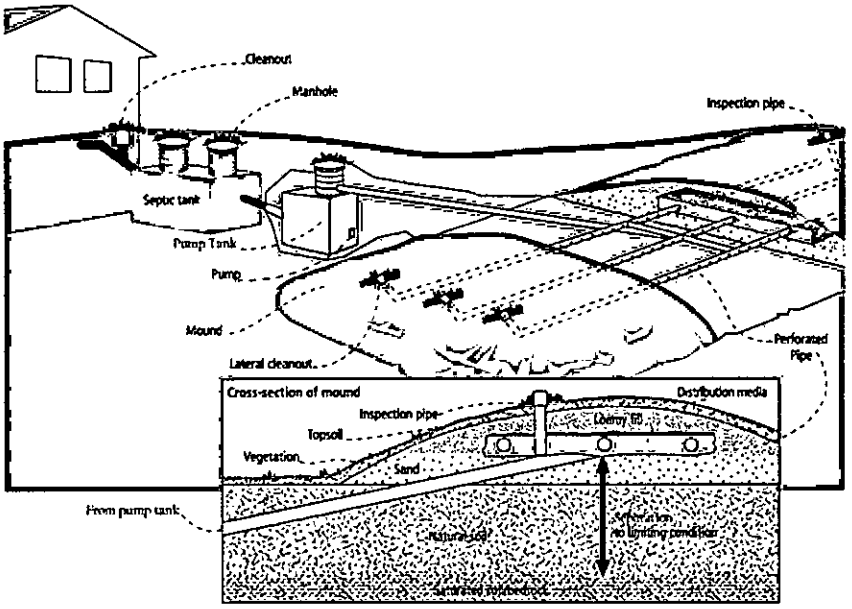
## For more information see http://septic.umn.edu

Version: August 2015

UNIVERSITY OF MINNESOTA

*Septic System Management Plan for Above Grade Systems*

## Your Septic System




### Septic System Specifics

System Type: ◯ I ◯ II ◯ III ◯ IV* ◯ V*

*(Based on MN Rules Chapter 7080.2200 – 2400)*

**Additional Management Plan required*

☐ System is subject to operating permit*

☐ System uses UV disinfection unit*

Type of advanced treatment unit _____

### Dwelling Type

Number of bedrooms: 5

System capacity/ design flow (gpd): 750

Anticipated average daily flow (gpd): 675

Comments _____

Business? : ◯ Y ◯ N What type? _____

### Well Construction

Well depth (ft): _____

☐ Cased well Casing depth: _____

☐ Other (specify): _____

Distance from septic (ft): 50'+

Is the well on the design drawing? ⊗ Y ◯ N

### Septic Tank

☑ First tank *Tank volume:* 1500 *gallons*

Does tank have two compartments? ⊗ Y ◯ N

☑ Second tank *Tank volume:* 1000 *gallons*

☑ Tank is constructed of CONCRETE

☐ Effluent screen: ◯ Y ⊗ N Alarm ◯ Y ◯ N

☑ Pump Tank 1000 *gallons*

☐ Effluent Pump *make/model*: _____

Pump capacity _____ GPM

TDH _____ Feet of head

☑ Alarm location HOUSE

### Soil Treatment Area (STA)

Mound/At-Grade area (width x length): 41 ft x 93 ft

Rock bed size (width x length): 10 ft x 63 ft

Location of additional STA: _____

Type of distribution media: _____

☐ Inspection ports ☐ Cleanouts

☐ Surface water diversions

☐ Additional STA not available

# Homeowner Management Tasks

These op*eration and maintenance ac*tivities are your responsibility. *Chart on page 6 can help track your activities.*

**Your toilet is not a garbage can. Do not flush anything besides human waste and toilet paper. No wet wipes, cigarette butts, disposal diapers, used medicine, feminine products or other trash!**

The system and septic tanks needs to be checked every 36 months

Your service provider or pumper/maintainer should evaluate if your tank needs to be pumped more or less often.

**Seasonally or several times per year**

- *Leaks.* Check (listen, look) for leaks in toilets and dripping faucets. Repair leaks promptly.
- *Soil treatment area.* Regularly check for wet or spongy soil around your soil treatment area. If surfaced sewage or strong odors are not corrected by pumping the tank or fixing broken caps and leaks, call your service professional. *Untreated sewage may make humans and animals sick.* Keep bikes, snowmobiles and other traffic off and control borrowing animals.
- *Alarms.* Alarms signal when there is a problem; contact your service professional any time the alarm signals.
- *Lint filter.* If you have a lint filter, check for lint buildup and clean when necessary. If you do not have one, consider adding one after washing machine.
- *Effluent screen.* If you do not have one, consider having one installed the next time the tank is cleaned along with an alarm.

**Annually**

- *Water usage rate.* A water meter or another device can be used to monitor your average daily water use. Compare your water usage rate to the design flow of your system (listed on the next page). Contact your septic professional if your average daily flow over the course of a month exceeds 70% of the design flow for your system.
- *Caps.* Make sure that all caps and lids are intact and in place. Inspect for damaged caps at least every fall. Fix or replace damaged caps before winter to help prevent freezing issues.
- *Water conditioning devices.* See Page 5 for a list of devices. When possible, program the recharge frequency based on *water demand (gallons)* rather than *time (days)*. Recharging too frequently may negatively impact your septic system. Consider updating to demand operation if your system currently uses time,
- *Review your water usage rate.* Review the Water Use Appliance chart on Page 5. Discuss any major changes with your service provider or pumper/maintainer.

**During each visit by a service provider or pumper/maintainer**

- Make sure that your service professional services the tank through the manhole. (NOT though a 4" or 6" diameter inspection port.)
- Ask how full your tank was with sludge and scum to determine if your service interval is appropriate.
- Ask your pumper/maintainer to accomplish the tasks listed on the Professional Tasks on Page 4.

# Professional Management Tasks

*These are the operation and maintenance activities that a pumper/maintainer performs to help ensure long-term performance of your system.* At each visit a written report/record must be provided to homeowner.

**Plumbing/Source of Wastewater**

- Review the Water Use Appliance Chart on Page 5 with homeowner.
  Discuss any changes in water use and the impact those changes may have on the septic system.
- Review water usage rates (if available) with homeowner.

**Septic Tank/Pump Tanks**

- *Manhole lid.* A riser is recommended if the lid is not accessible from the ground surface. Insulate the riser cover for frost protection.
- *Liquid level.* Check to make sure the tank is not leaking. The liquid level should be level with the bottom of the outlet pipe. (If the water level is below the bottom of the outlet pipe, the tank may not be watertight. If the water level is higher than the bottom of the outlet pipe of the tank, the effluent screen may need cleaning, or there may be ponding in the soil treatment area.)
- *Inspection pipes.* Replace damaged or missing pipes and caps.
- *Baffles.* Check to make sure they are in place and attached, and that inlet/outlet baffles are clear of buildup or obstructions.
- *Effluent screen.* Check to make sure it is in place; clean per manufacturer recommendation. Recommend retrofitted installation if one is not present.
- *Alarm.* Verify that the alarm works.
- *Scum and sludge.* Measure scum and sludge in each compartment of each septic and pump tank, pump if needed.

**Pump**

- *Pump and controls.* Check to make sure the pump and controls are operating correctly.
- *Pump vault.* Check to make sure it is in place; clean per manufacturer recommendations.
- *Alarm.* Verify that the alarm works.
- *Drainback.* Check to make sure it is draining properly.
- *Event counter or elapsed time meter.* Check to see if there is an event counter or elapsed time meter for the pump. If there is one or both, calculate the water usage rate and compare to the anticipated use listed on Design and Page 2. Dose Volume: _____ gallons: Pump run time: _____ Minutes

**Soil Treatment Area**

- *Inspection pipes.* Check to make sure they are properly capped. Replace caps and pipes that are damaged.
- *Surfacing of effluent.* Check for surfacing effluent or other signs of problems.
- *Lateral flushing.* Check lateral distribution; if cleanouts exist, flush and clean at recommended frequency.
- *Vegetation* - Check to see that a good growth of vegetation is covering the system.

**All other components – evaluate as listed here:**

## Water-Use Appliances and Equipment in the Home

| Appliance | Impacts on System | Management Tips |
|---|---|---|
| Garbage disposal | • Uses additional water.<br>• Adds solids to the tank.<br>• Finely-ground solids may not settle. Unsettled solids can exit the tank and enter the soil treatment area. | • Use of a garbage disposal is not recommended.<br>• Minimize garbage disposal use. Compost instead.<br>• To prevent solids from exiting the tank, have your tank pumped more frequently.<br>• Add an effluent screen to your tank. |
| Washing machine | • Washing several loads on one day uses a lot of water and may overload your system.<br>• Overloading your system may prevent solids from settling out in the tank. Unsettled solids can exit the tank and enter the soil treatment area. | • Choose a front-loader or water-saving top-loader, these units use less water than older models.<br>• Limit the addition of extra solids to your tank by using liquid or easily biodegradable detergents. Limit use of bleach-based detergents and fabric softeners.<br>• Install a lint filter after the washer and an effluent screen to your tank<br>• Wash only full loads and think even – spread your laundry loads throughout the week. |
| Dishwasher | • Powdered and/or high-phosphorus detergents can negatively impact the performance of your tank and soil treatment area.<br>• New models promote "no scraping". They have a garbage disposal inside. | • Use gel detergents. Powdered detergents may add solids to the tank.<br>• Use detergents that are low or no-phosphorus.<br>• Wash only full loads.<br>• Scrape your dishes anyways to keep undigested solids out of your septic system. |
| Grinder pump (in home) | • Finely-ground solids may not settle. Unsettled solids can exit the tank and enter the soil treatment area. | • Expand septic tank capacity by a factor of 1.5.<br>• Include pump monitoring in your maintenance schedule to ensure that it is working properly.<br>• Add an effluent screen. |
| Large bathtub (whirlpool) | • Large volume of water may overload your system.<br>• Heavy use of bath oils and soaps can impact biological activity in your tank and soil treatment area. | • Avoid using other water-use appliances at the same time. For example, don't wash clothes and take a bath at the same time.<br>• Use oils, soaps, and cleaners in the bath or shower sparingly. |
| **Clean Water Uses** | **Impacts on System** | **Management Tips** |
| High-efficiency furnace | • Drip may result in frozen pipes during cold weather. | • Re-route water directly out of the house. Do not route furnace discharge to your septic system. |
| Water softener<br>Iron filter<br>Reverse osmosis | • Salt in recharge water may affect system performance.<br>• Recharge water may hydraulically overload the system. | • These sources produce water that is not sewage and should not go into your septic system.<br>• Reroute water from these sources to another outlet, such as a dry well, draintile or old drainfield.<br>• When replacing, consider using a demand-based recharge vs. a time-based recharge.<br>• Check valves to ensure proper operation; have unit serviced per manufacturer directions |
| Surface drainage<br>Footing drains | • Water from these sources will overload the system and is prohibited from entering septic system. | |

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*Septic System Management Plan for Above Grade Systems*

## Homeowner Maintenance Log

*Track maintenance activities here for easy reference. See list of management tasks on pages 3 and 4.*

| Activity | Date accomplished | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ***Check frequently:*** | | | | | | | | | | |
| Leaks: check for plumbing leaks* | | | | | | | | | | |
| Soil treatment area check for surfacing** | | | | | | | | | | |
| Lint filter: check, clean if needed* | | | | | | | | | | |
| Effluent screen (if owner-maintained)*** | | | | | | | | | | |
| Alarm** | | | | | | | | | | |
| ***Check annually:*** | | | | | | | | | | |
| Water usage rate (maximum gpd _____) | | | | | | | | | | |
| Caps: inspect, replace if needed | | | | | | | | | | |
| Water use appliances – review use | | | | | | | | | | |
| Other: | | | | | | | | | | |

*Monthly

**Quarterly

***Bi-Annually

Notes:

*"As the owner of this SSTS, I understand it is my responsibility to properly operate and maintain the sewage treatment system on this property, utilizing the Management Plan. If requirements in this Management Plan are not met, I will promptly notify the permitting authority and take necessary corrective actions. If I have a new system, I agree to adequately protect the reserve area for future use as a soil treatment system."*

Property Owner Signature: _____ Date _____

Management Plan Prepared By: R&R SEPTIC Certification # C75

Permitting Authority: MILLE LACS COUNTY

# CONTRUCTION OF SANITATION FACILITIES
# FOR

# EXISTING CATEGORY HOMES
# AT

# SCATTERED SITES
# ON THE

# MILLE LACS INDIAN RESERVATION
# MILLE LACS, KANEBEC, AITKIN, AND PINE COUNTIES, MINNESOTA

## PROJECT BE-17-L02
## RICHARD HILL

## DRAWINGS AND SPECIFICATIONS


**U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES**
**PUBLIC HEALTH SERVICE**
**INDIAN HEALTH SERVICE**
**OFFICE OF ENVIRONMENTAL HEALTH**
**AND ENGINEERING**
**BEMIDJI AREA OFFICE**

# SPECIFICATION INDEX

**SECTION 01100**
**SUMMARY OF WORK**

## PART 1 - GENERAL

### 1.01 SUMMARY

A. The work to be performed under this contract shall consist of furnishing the following to perform the work outlined in these specifications and as indicated by Project Drawings:

1. tools
2. equipment
3. materials
4. labor
5. supplies
6. manufactured articles
7. all transportation to complete the work
8. temporary facilities

B. Location of Work: Richard Hill, 31972 115th Ave, Onamia, Mille Lacs County, Minnesota, for the Mille Lacs Band of Ojibwe

C. Incidentals Items: All work, materials, and services not expressly listed as being provided by others or not expressly called for in the specifications but are necessary for the completion of the work in good faith, shall be furnished, installed, and performed by the contractor.

### 1.02 SUMMARY OF WORK TO BE DONE BY CONTRACTOR

A. Individual Wastewater Facilities

1. Install Septic Tanks, Pump Tank and Mound System.
2. Install per design, drawing and specifications.
3. Abandonment/Removal of Existing Tanks and Mound System
4. Acquire ISTS Permit

### 1.03 ADDITIONAL INFORMATION

A. For information regarding contracting information, contact the Owner's Representative for this project:

Brian Scheinost
Public Works Administrator
Mille Lacs Public Works
43408 Oodena Drive

Onamia, MN  56359
Telephone: (320) 532-7437

C. Comply with all Tribal regulations related to the completion of the work including the acquisition of necessary permits and the payment of Tribal taxes.

1.04 WARRANTY

A. Provide a minimum one (1) year warranty for all materials and labor, covering defects in the materials or deficiencies resulting from Contractor installation and materials.

1.05 ADDITIONAL REQUIREMENTS

A. Contractor shall be licensed and insured.

**END OF SECTION**

# SECTION 01270
# PRICE AND PAYMENT

## PART 1 - GENERAL

### 1.01 SUMMARY

A. Work covered by this section includes method of measurement and basis of payment for all divisions included.

B. Payment for the various items of the Bid Schedules, as further specified herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, materials, labor, supplies, manufactured articles, transportation, and temporary facilities required to complete the work in accordance with contract documents including incidentals.

C. Respective prices and payment shall constitute full compensation for all work completed including incidentals.

D. All items not expressly listed as being provided by others that are necessary for the completion of work shall be furnished and installed by the Contractor.

E. No payment shall be made for mobilization and demobilization of equipment.

### 1.02 ESTIMATED QUANTITIES

A. All quantities stipulated in the bid schedule or other contract documents are approximate and are to be used: (1) as a basis for estimating the probable cost of the work and (2) for the purpose of comparing the bids submitted.

B. The Contractor shall be paid for actual quantities installed based on the quantities measured in the field. The actual amounts of work completed and materials furnished may differ from estimated quantities. The Contractor shall make no claim for damages, anticipated profits, or otherwise, on account of differences between the estimated amounts and the actual amount of work performed and materials furnished.

### 1.03 SURVEY AND MEASUREMENTS

A. All quantity measurements shall be the responsibility of the Contractor and will be verified by the Engineer.

B. All measurements and subsequent payments will be based on completed and accepted work performed in strict accordance with the drawings, specifications, and other contract documents.

## PART 2 – BID SCHEDULE ITEMS

2.01 GENERAL

A. Payment shall be full compensation to complete the work items in good faith, including incidental work.

B. In addition to the those things listed under each item, the unit price bid shall be full compensation for all of the following:

1. General requirements in Division 01, but not limited to the following.

    a. Submittals
    b. Record drawings

2. Specific requirements in Division 02, including but not limited to the following (unless otherwise expressly defined as a line item in the bid schedule):

    a. Erosion control
    b. Clearing and grubbing
    c. Removal and replacement of obstructions
    d. Associated trenching, excavation and backfill including the removal of any nuisance water, bedding, haunching, and compaction.
    e. Disposal of any excess material
    f. Traffic control
    g. Rough grading
    h. Finish work, where called for, including finish grading, topsoiling, and landscaping

2.02 BID ITEMS

A. Individual Wastewater Facilities Design

1. 1500 Gallon Combo Septic Tank
    a. Measurement: Per each tank installed.
    b. Basis for Payment: Payment shall be full compensation for septic tank, fittings, risers, connections, excavation, compaction, grading, and site restoration.

2. 1000 Gallon Septic Tank
    a. Measurement: Per each tank installed.
    b. Basis for Payment: Payment shall be full compensation for septic tank, fittings, risers, connections, excavation, compaction, grading, and site restoration.

3. 1000 Gallon Pump Tank:

a. Measurement: Per each tank installed.
b. Basis for Payment: Payment shall be full compensation for pump tank, fittings, risers, connections, excavation, compaction, grading, and site restoration.

4. 4-Inch Solid PVC Pipe:
   a. Measurement: Per linear foot,
   b. Basis for Payment: Includes pipe, fittings, connections, excavation, trenching, bedding, haunching, backfill, compaction, grading, and site restoration.

5. Two-way Cleanout:
   a. Measurement: By each unit installed.
   b. Basis for Payment: Includes pipe, fittings, covers, connections, excavation, trenching, bedding, haunching, backfill, compaction, grading, and site restoration.

6. Effluent Pump with Controls:
   a. Measurement: By each unit installed.
   b. Basis for Payment: Includes pump, control, alarm system, float switches, above ground electrical wiring, in-chamber piping, union, fittings and connections.

7. Electrical Cable:
   a. Measurement: Per linear foot.
   b. Basis for Payment: Payment shall be full compensation for cable, splices, conduit, excavation, trenching, bedding, backfill, compaction, grading, and site restoration.

8. 2-inch Solid PVC Effluent Pipe:
   a. Measurement: Per linear foot.
   b. Basis for Payment: Payment shall be full compensation for pipe, fittings, connections, excavation, trenching, bedding, haunching, backfill, compaction, grading, and site restoration.

9. Mound System
   a. Measurement: Lump Sum for the complete mound system.
   b. Basis for Payment: Payment shall be full compensation for a complete and operational mound system per the design and specifications. This includes clean sand material, loam fill, topsoil, gravel synthetic material and placement, scarification of the original topsoil, removing excessive vegetation, manifold piping, perforated pipe, seeding, protective cover for seeding, observation pipes and all other incidentals.

10. Existing Tank and Mound Removal:
    a. Measurement: Lump Sum.

b. Basis for Payment: Payment shall be full compensation for the pumping and removal of existing septic tank, removal of existing mound piping, rock bed and sand, and off site disposal of removed materials. Topsoil and cover sand may be stored onsite and reused.

11. ISTS Permit:
    a. Measurement: Per each permit obtained.
    b. Basis for Payment: Payment includes site evaluation, permit application, and permit fee submitted to appropriate local authority.

12. Construction Incidentals:
    a. Measurement: Lump Sum.
    b. Basis for Payment: Includes other incidental items not specifically covered in other pay items including plowing of original topsoil and removing excessive vegetation, placing topsoil, observation ports, temporary road, and all other appurtenances required to complete the work as specified.

**PART 3 – EXECUTION (N/A)**

**END OF SECTION**

**SECTION 01300**
**ADMINISTRATIVE REQUIREMENTS**

## PART 1 - GENERAL

1.01 SUMMARY

A. Section includes the administrative notes and requirements for this contract.

1.02 For all contracts:

A. The Indian Health Service (IHS) is the engineer for this project; however, this is not a federal contract. IHS reserves the right to inspect the work performed by the Contractor or any of its Subcontractors. IHS does not represent the Tribe and the Tribe does not represent IHS regarding any matter related to administration of this Contract.

B. IHS Indian preference requirements apply to the solicitation and award of this contract. If the tribe has enacted an Indian preference ordinance, it may apply in lieu of the IHS requirements.

C. SUSPENSION AND TERMINATION OF WORK

1. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any change proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

2. If the Contractor fails to perform the work in accordance with the Contract Documents, Owner may declare the Contractor to be in default and give Contractor notice that the Contract is terminated. The termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor.

3. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for completed and acceptable work executed in accordance with the Contract Documents prior to the effective date of termination. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

D. Contractor shall comply with 41 CFR 60-1.4(b) in accordance with Executive Order 11246, “Equal Employment Opportunity,” as amended by Executive Order 11375, “Amending Executive Order 11246 Relating to Equal Employment Opportunity.

E. Debarment and Suspension (Executive Orders 12549 and 12689)—A contract award (see 2 CFR 180.220) must not be made to parties listed on the government-wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR part 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), “Debarment and Suspension.” SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

F. Contractor is required to perform thirty-three and one-third percent of the total amount of the Work using its own employees and equipment. Copies of subcontract agreements may be requested to verify the amount of Work performed.

1.03 For Contracts Exceeding $2,000:

A. The Contractor shall comply with wage and provisions of the Davis-Bacon Act (40 U.S.C. 3141-3148) as supplemented by Department of Labor regulations (29 CFR part 5). In accordance with the statute, Contractors must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor.

B. The Contractor shall comply with the Copeland “Anti-Kickback” Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR part 3). The Act provides that each Contractor or subrecipient must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled.

1.04 For Contracts Exceeding $10,000:

A. Contractor shall comply with the requirements of 41 CFR 60-4 regarding required notices and procedures to be followed in soliciting for federally assisted construction contracts (including subcontracts). Compliance with Executive Order 11246 and 41 CFR part 60-4 shall be based on implementation of the Equal Opportunity Clause, specific affirmative active obligations required by the Standard Federal Equal Employment Opportunity Construction Contract Specifications, as set forth in 41 CFR Part 60-4.3(a) and efforts to meet the goals established for the geographical area where the Contract is to be performed.

1.05 For Contracts Exceeding $100,000:

A. The Contractor shall comply with the provisions of the Work Hours and Safety Standards Act (40 U.S.C. 3701-3708). Under 40 U.S.C. 3702 of the Act, each Contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous.

B. The Contractor shall comply with the provisions of the Byrd Anti-Lobbying Amendment (31 U.S.C. 1352), certifying that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award.

**END OF SECTION**


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# SECTION 01310
# PROJECT MANAGEMENT AND COORDINATION

## PART 1 - GENERAL

### 1.01 SUMMARY

A. Section includes the preconstruction conference, construction scheduling and coordination requirements.

### 1.02 PRE-CONSTRUCTION CONFERENCE

A. Required after award of contract and prior to start of construction.

B. Representatives from the following shall attend.

1. Prime Contractor
2. Subcontractors
3. Engineer and Technical Representative
4. Owner’s Representative

C. Engineer will arrange a date that is mutually acceptable to all parties planning to attend.

D. Contractor shall notify subcontractors of time and date of meeting.

### 1.03 CONSTRUCTION SCHEDULE

A. Present Owner and Engineer with a written preliminary construction schedule containing start and completion dates of the major items at the preconstruction meeting.

B. Notify the Owner and Engineer seven (7) days in advance of any construction.

C. Communicate major changes to the schedule to the Owner and Engineer in writing.

### 1.04 WORKING HOURS/DAYS

A. Except as required for safety purposes, all work shall be performed during regularly scheduled working hours. The Contractor shall not work on Saturday, Sunday, or a Federal holiday without the Owner and Engineer’s consent.

1.05 COORDINATION WITH OTHER CONTRACTORS/UTILITIES

A. Coordinate work with other contractors (i.e. roads, building, etc) in the area as necessary to complete the work specified.

B. Coordinate work with local utilities (i.e. water and sewer, power, telephone). Note: all buried utilities may not be shown on the plans. Contractor's responsibility for having utilities marked prior to construction.

**END OF SECTION**

# SECTION 01330
# SUBMITTAL PROCEDURE

## PART 1 - GENERAL

### 1.01 SUMMARY

A. This section includes information on submittal procedures. Materials requiring submittal are listed in the appropriate specification section.

### 1.02 SUBMITTAL PROCEDURES

A. Submit copies of submittals to the Engineer, unless requested otherwise.

1. Contractor's option:
   a. Two (2) hard copies.
   b. An electronic copy in pdf format delivered to Engineer via email or other means as approved by the Engineer.

B. Identify each cut sheet or shop drawing with the following information:

1. Contract number.
2. Supplier.
3. Specification section to which the submittal pertains.

C. Submit the following information, as applicable:

1. Manufacturer's cut sheets indicating compliance with references (e.g. applicable ASTM, AWWA standards).
2. Laboratory results, as applicable.
3. Dimensional drawings or shop drawings, as applicable.
4. Other information necessary for the Engineer to determine compliance with the specifications.
5. Clearly identify brand, manufacturer, model number, sizes, and all other information on each cut sheet to identify the exact product being submitted for approval.

D. Identify variations from the contract documents and product or system limitations that may be detrimental to successful performance of the completed work.

E. Revise and resubmit submittals as required and identify all changes made since previous submittal.

F. Distribute copies of reviewed submittals to concerned parties, (i.e. suppliers, sub-contractors).

G. Submit written communication of any inability to comply with the Engineer's comments.

H. Submit information to the Engineer at least three weeks in advance of the work to be performed.

I. Approval of submittals must be provided by the Engineer prior to installation of materials.

**END OF SECTION**

# SECTION 01420
# REFERENCES

## PART 1 - GENERAL

### 1.01 SUMMARY

A. This section includes a list of common organizations, associations or appropriate agencies with jurisdiction that have references, standards, laws or regulations cited in these specifications. This list is not all-inclusive. Other agencies (county, local, tribal) with jurisdiction might not be listed here.

B. Use latest revision of all references, standards, laws or regulations.

### 1.02 LIST OF ORGANIZATIONS, ASSOCIATIONS & AGENCIES

A. National Standards Organizations & Associations

American Association of State Highway and Transportation Officials (AASHTO)
444 North Capital Street NW, Suite 249
Washington DC, 20001
(202) 624-5800
www.aashto.org

American Concrete Institute (ACI)
ACI International
PO Box 9094
Farmington Hills, Michigan 48333-9094
(810) 848-3700
www.aci-int.org

American Society for Testing and Materials (ASTM)
100 bar Harbor Drive
West Conshohocken, Pa 19428-2959
(610) 832-9585
www.astm.org

American Water Works Association AWWA
6666 West Quincy Avenue
Denver, CO 80235
(303) 794-7711
www.awwa.org

National Electric Code (NEC)
National Fire and Protection Association
1 Batterymarch Park
Quincy, MA 02269-9959
1 888 632-2633
www.nec.com

National Electrical Manufacturer's Association
NEMA
1300 North 17th Street
Rosslyn, VA 22209
(703) 841-3200
www.nema.org

Underwriters' Laboratories, Inc. UL
333 Pfingston Road
Northbrook, IL 60062
(847) 272-8800
www.ul.com

B. Federal Agencies

Environmental Protection Agency (EPA)
Region 5
77 West Jackson
Chicago, IL 60604-3507
http://www.epa.gov/r5water/

Occupational Health and Safety Administration
Region 5 (OSHA)
238 South Dearborn Street , Room 3244
Chicago, IL 60604
www.osha.gov

C. State Agencies

Minnesota Department of Transportation
(MNDOT)
Transportation Building
395 John Ireland Boulevard
St. Paul, MN 55155
1 800 651-3774
www.dot.state.mn.us

Minnesota Pollution Control Agency (MPCA)
Individual Sewage Treatment System Standard
520 Lafayette Road
St Paul, MN 55155
1 800 657-3864
www.pca.state.mn.us

Minnesota Department of Health
717 Delaware Street South East
Minneapolis, MN 55440-9441
(651) 201-5000
www.health.state.mn.us

D. Local Agencies

1. Contractor shall review other local agency requirements to determine applicability with this project.

E. Tribal Organizations

1. See Section 01100 for appropriate tribal contact regarding tribal laws.

**PART 2 – PRODUCTS (N/A)**

**PART 3 – EXECUTION (N/A)**

**END OF SECTION**

# SECTION 01430
# QUALITY ASSURANCE

## PART 1 - GENERAL

### 1.01 SUMMARY

A. This section includes prerequisites and procedures to assure the quality of construction.

### 1.02 SUBMITTALS

A. Contractor Name and License Number

### 1.03 INSTALLER QUALIFICATIONS

A. Work shall be performed under the direction of personnel licensed in the state/reservation where the project is proposed and where licensing of the trade is regulated by the state/reservation including, but not limited to, plumbing, well drilling, septic system installation, HVAC, and electrical work.

### 1.04 CONTROL OF INSTALLATION

A. Review materials for acceptability when delivered to the site.

B. Store and handle materials to prevent damage.

C. Review materials, services, and workmanship to ensure that work is performed in accordance with the specifications.

D. Comply fully with manufacturers' instructions.

E. Should manufacturers' instructions conflict with contract documents, request clarification from Engineer before proceeding.

F. Correct defective work to the satisfaction of the Project Engineer.

### 1.05 MANUFACTURER'S FIELD SERVICES

A. Provide reports on observations and documentation of workmanship to the Engineer within 30 days of visit for review where manufacturers' field services are provided.

### 1.06 WARRANTY

A. Provide a minimum one (1) year warranty for all materials and labor, covering defects in the materials or deficiencies resulting from contractor installation.

B. Provide additional warranties as required under other sections.

**END OF SECTION**

# SECTION 01500
# TEMPORARY FACILITIES AND CONTROLS

## PART 1 - GENERAL

### 1.01 SUMMARY

A. The work covered by this section includes all temporary facilities and controls needed to complete work under the Contract in a manner that protects public safety and worker safety, that preserves both public and private property and that appropriately involves local governments, emergency and law enforcement.

### 1.02 RELATED WORK

A. Section 02315 – Excavation, Trenching and Backfill

B. Section 02705 – Road Restoration

### 1.03 REFERENCES

A. Manual on Uniform Traffic Control Devices

## PART 2 – PRODUCTS (NOT APPLICABLE)

## PART 3 - EXECUTION

### 3.01 GENERAL

1. Provide temporary facilities and controls that are necessary to carry out the requirements of the Contract in a manner

    1. That protects public safety and worker safety

    2. That preserves both private and public property

    3. That communicates and cooperates with local authorities and governments.

### 3.02 TEMPORARY WATER (IF APPLICABLE)

A. If there is an existing building or hydrant on the site from which water can be taken, Contractor may use the available water if authorized by the Owner.

B. If the Owner has water supply mains, but no hydrant is available, Contractor may make a water main tap and create a service line if authorized by the Owner.

C. If the Owner does not have a water supply, make arrangements to obtain water and pay for it at no direct cost to the project.

D. Cross Connection Control: When connecting to the Owner's water supply, provide appropriate backflow prevention devices in accordance with State codes and the Owner's requirements.

3.03 TEMPORARY SANITARY FACILITIES

A. Provide and maintain a chemical toilet approved by the State Department of Health (MN) for the use of all workers of all trades.

B. Place temporary facilities in an inconspicuous place and keep clean.

C. Remove temporary sanitary facilities after completion of the project.

3.04 BARRICADES & WARNING DEVICES

A. Notify local police, fire departments and other emergency programs of any proposed barricading or detouring.

B. Erect and maintain barricades, guardrails, lights and signs as necessary for public convenience and safety.

C. Ensure that barricades remain in place during critical hours.

D. Comply with "Occupational Safety and Health Act" and local safety requirements, as they apply.

3.05 TRAFFIC CONTROL

A. Conduct all traffic control operations in accordance with the latest issues of the "Manual On Uniform Traffic Control Devices" (MUTCD).

B. Coordinate and obtain approval for all traffic control from local law enforcement.

C. Signs, Signals and Devices

1. Place warning signs in the region of the work.

2. Warn of types of conditions that may be encountered.
   a. Muddy Roads
   b. Slippery Roads
   c. Flagman
   d. Detour
   e. Slow Moving Traffic

f. Trucks Entering Roadway

3. Traffic Control Signals: Meet the needs of the local government authority.

4. Traffic Cones and Drums, Flares and Lights:
   a. Meet the needs of the local jurisdictions.
   b. Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.
   c. Ensure that flares, lights, etc. remain in position throughout the night.

5. Flagman:
   a. Meet the needs of the local jurisdictions.
   b. Provide trained and equipped flagmen to regulate traffic when construction operations or traffic encroach on public traffic lanes.

C. Haul Routes:

1. Consult with authority having jurisdiction in establishing public thoroughfares to be used for haul routes and site access.

2. Confine construction traffic to designated haul routes.

3. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.

D. Removal of Traffic Control:

1. Remove equipment and devices when no longer required.

2. Repair damage caused by installation.

## 3.06 ACCESS ROADS

A. Construct and maintain temporary roads accessing public thoroughfares to serve construction area.

B. Provide detours necessary for unimpeded traffic flow.

C. Provide and maintain access to fire hydrants, free of obstructions.

D. Permanent access roads and parking areas, if applicable, will be covered in Division 2, Site Work.

## 3.07 PARKING

A. If the site is large enough, the Contractor may park their own and employees' vehicles on the site without charge after obtaining permission from the Owner.

B. If the site is not large enough, the Contractor shall make parking arrangements.

C. Prevent interference with the flow of local traffic.

D. Prevent interference with emergency vehicle functions.

3.08 ROAD SURFACE MAINTENANCE

A. Remove mud and excavated spoils from the affected roadway at the end of each workday in order to preserve the roadways and maintain safe driving conditions.

B. Contractor is responsible for any costs associated with repairing the roadways that are damaged due to construction equipment.

3.09 WATER CONTROL

A. Grade site to drain.

B. Protect site from puddling or running water.

C. Provide water barriers as required to protect site from soil erosion.

3.10 DUST CONTROL

A. Use measures to minimize dust caused by the project.

B. Avoid dust-creating activities during dry, windy conditions.

3.11 SECURITY

A. The Owner will **not** be responsible for security on the site of work.

B. Each Contractor will be held responsible for loss or injury to persons or property where their work is involved.

C. Provide (if deemed necessary) such watchmen and take such other precautionary measures as deemed necessary to protect facilities during the contract period.

3.12 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris and rubbish. Maintain site in a clean and orderly condition.

B. Remove waste materials, debris, and rubbish from site weekly and dispose off-site.

3.13 REMOVAL OF UTILITIES, FACILITIES & CONTROLS

A. Remove temporary above grade or buried utilities, equipment, facilities, materials, prior to inspection.

B. Clean and repair damage caused by installation or use of temporary work.

C. Restore existing facilities used during construction to original condition.

3.14 TEMPORARY FIRST AID FACILITIES

A. Provide temporary first aid facilities for employees in sufficient quantity for the number of workers.

3.15 TEMPORARY FIRE PROTECTION

A. Post fire department telephone numbers at the jobsite.

B. Keep fire extinguishers on the job that are appropriate for the type of work being performed.

**END OF SECTION**


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# SECTION 01770
# CLOSEOUT PROCEDURES

## PART 1 - GENERAL

1.01 SUMMARY

A. Section includes information on closeout procedures and final cleaning.

1.02 RELATED WORK

A. Section 01780 – Closeout Submittals

1.03 CLOSEOUT PROCEDURES

A. Submit written certification that work is complete in accordance with contract documents and ready for final inspection at least three (3) working days prior to final inspection.

B. Provide warranties and record documents (e.g. as-built drawings) to the Engineer that are required within ten (10) days after date of first beneficial use. Refer to Section 01780.

1.04 FINAL CLEANING

A. Complete final clean-up prior to final inspection.

B. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.05 FINAL INSPECTION

A. A final inspection of the facilities shall be conducted in the presence of the Owner, the Engineer, and the Contractor, at a minimum.

B. Final inspection shall include inspection of all facilities installed under the project.

1.06 PUNCH LIST

A. Any deficiencies noted at the Final Inspection will be communicated to the Contractor through a letter from the Engineer.

B. All deficiencies will need to be completed before full payment is made.

C. Retainage for punch list items shall be based on the estimated cost to retain another contractor to finish the deficient work items.

**END OF SECTION**


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# SECTION 01780
# CLOSEOUT SUBMITTALS

## PART 1 - GENERAL

### 1.01 SUMMARY

A. This section describes the requirements for closeout submittals including, record drawings, warranty information and general operation and maintenance information.

### 1.02 RELATED WORK

A. Section 01430 – Quality Assurance
B. Section 01770 – Closeout Procedures
C. Section 01785 – Operation and Maintenance Manuals (If applicable)

### 1.03 DELIVERY

A. Provide all closeout submittals meeting these requirements and any specific requirements of each section.

B. Closeout submittals must be received before payment is requested for the work that the drawings describe or illustrate.

C. All closeout submittals must be received in a correct and complete manner before final payment can be made. If material is deficient, the deficiencies will be indicated in punch lists (Section 01770).

### 1.04 DEFINITIONS

A. Record Drawing: A drawing showing the actual installation of facilities, showing changes from the plans, and showing detail enough that future persons can readily locate all objects.

B. Ties: Measurements from permanent easily located objects to an installed object.

## PART 2 – PRODUCTS (NOT APPLICABLE)

## PART 3 - EXECUTION

### 3.01 RECORD DRAWINGS

A. Provide record data in one of the following manners:

1. On a set of project drawings, neatly draw tie measurements and changes.
2. On separate 8½ X 11 sheets (see 01780D – Closeout Submittal Drawings), neatly draw site sketches, structure sketches, etc., indicating the necessary information.

B. Provide three (3) swing tie measurements to all buried utility objects that may need to be located in the future, including, but not limited to:

1. Gate valves
2. Corporation stops
3. Curb stops
4. Water main fittings
5. Couplings to existing water systems.
6. Cleanouts
7. Sewer wyes.
8. Utility crossings.
9. Septic tank manholes and access covers.
10. Corners of drainfields
11. Tracer Wire Boxes

C. Provide offset measurements for buried utilities (e.g. water main) installed parallel to roads.

D. Provide revised elevation data for all items that have elevations shown on the plan drawings, including, but not limited to, the following:

1. Manhole inverts (inlet and outlet)
2. Manhole rims
3. Lift station invert
4. Lift station top
5. Lift station pipe penetrations
6. Float elevations
7. Septic tank elevations
8. Elevations of pipe entering and leaving structures
9. Elevation of sewer service line stub (if terminated at right of way)
10. Other elevations indicated on profiles.

E. Provide installed bid schedule items quantities for individual facilities on 8½ X 11 sheets.

1. Engineer may supply standard forms for use by the Contractor.

## 3.02 WARRANTIES

A. Submit all warranty information regarding the materials installed.

B. Minimum warranty information is listed in Section 01430.

3.03 OPERATION AND MAINTENANCE INFORMATION

A. Submit all operation and maintenance information as included in the packaging from the manufacturer regarding the materials installed.

B. Additional project specific operation and maintenance requirements are listed in Section 01785.

**END OF SECTION**


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AS-BUILT DRAWING

NORTH ARROW

HOMEOWNER:
PROJECT NO:
RESERVATION:
ADDRESS:
LEGAL DESCRIPTION:

| ITEM DESCRIPTION | SYMBOLS | MATERIALS SIZE | MAT'L | QUANT. | HOUSE CORNER TIES (FT.) A | B | C | D |
|---|---|---|---|---|---|---|---|---|
| CURB STOP | ⊙ | " | | | | | | |
| WELL | Ⓦ | " | | | | | | |
| SEPTIC TANK | ▭ | GAL | | | | | | |
| COMBINATION SEPTIC/PUMP TANK | ▭ ▭ | GAL | | | | | | |
| TWO WAY CLEANOUT | ●● | " | | | | | | |
| ONE WAY CLEANOUT | ● | " | | | | | | |
| FREEZELESS RISER | Ⓕ | ' | | | | | | |
| WATER SERVICE LINE | —— W —— | " | | | | | | |
| SEWER SERVICE LINE | —— S —— | " | | | | | | |
| DRAIN FIELD | ▭▭▭▭▭ | " | | | | | | |
| PERFORATED PIPE | —— | " | | | | | | |
| SEWER FORCE MAIN | —— SFM —— | | | | | | | |
| INSULATION | ▨ | | | | | | | |
| BURIED ELECTRICAL LINE | —— E —— | | | | | | | |
| WATER MAIN | —— W/M —— | " | | | | | | |
| SEWER MAIN | —— S/M —— | " | | | | | | |

DISPOSAL SYSTEM

TYPE: ☐ CONVENTIONAL
☐ IN-GROUND
☐ AT-GRADE
☐ MOUND

MATERIAL:
DIMENSIONS:

DRAWN BY:
DATE:
COMPANY:
REMARKS:

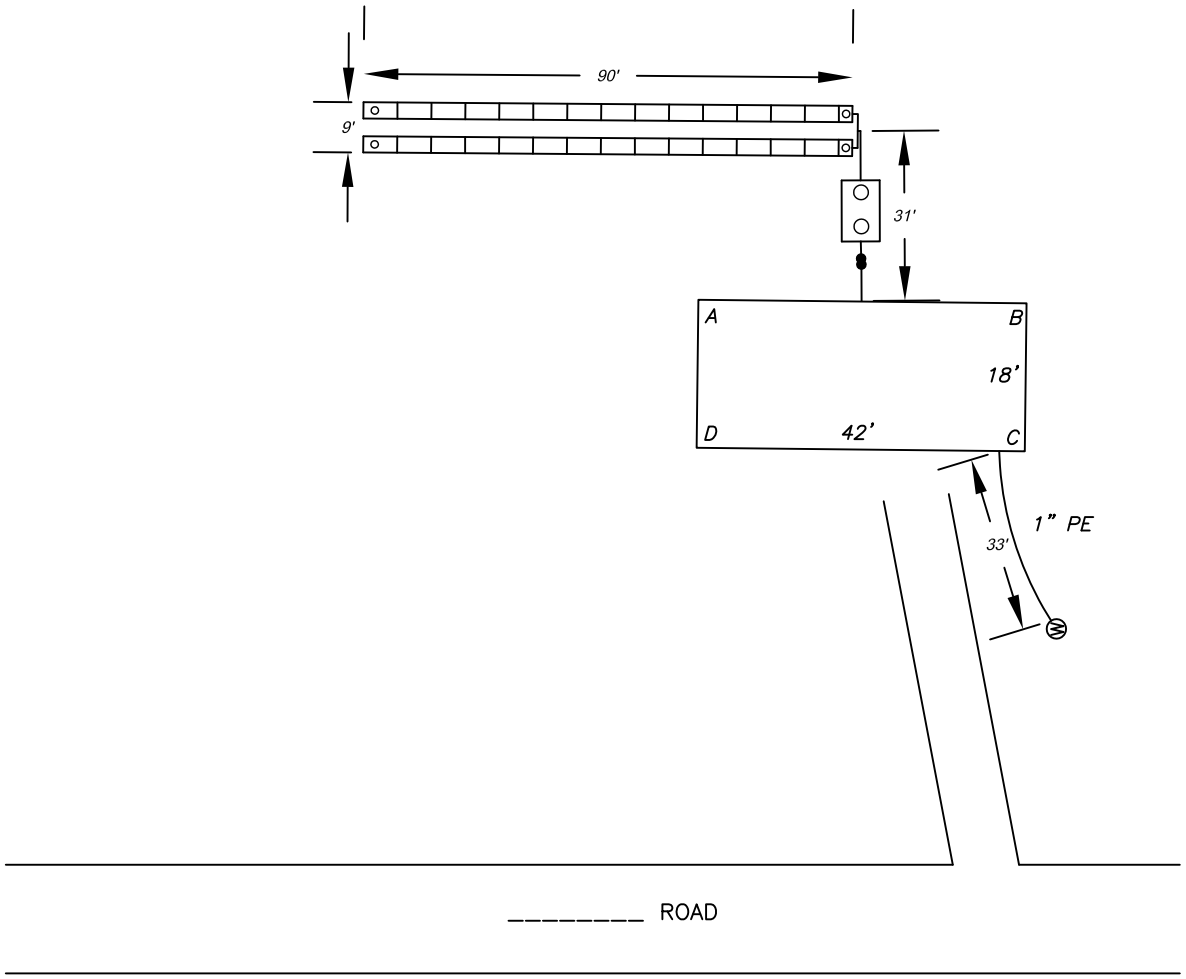
DRAWING NO.
01780-1

USER: jzierden FILE: I:\STANDARD DETAILS\CSI-SPECS\2012\01780-1.dwg 12/14/2012 - 9:20am

AS-BUILT DRAWING

NORTH ARROW

HOMEOWNER: [NAME]
PROJECT NO: [IHS PROJECT NO.]
RESERVATION:
ADDRESS:
LEGAL DESCRIPTION:




| ITEM DESCRIPTION | SYMBOLS | MATERIALS SIZE | MAT'L | QUANT. | HOUSE CORNER TIES (FT.) A | B | C | D |
|---|---|---|---|---|---|---|---|---|
| CURB STOP | ⊙ | | | | | | | |
| WELL | Ⓦ | 6" | STEEL | 1 | | | 33.2' | 74.1' |
| SEPTIC TANK | ▭ | 1000 GAL | CONCRETE | 1 | 35.0' | 35.0' | | |
| | | | | | 52.0' | 52.0' | | |
| COMBINATION SEPTIC/PUMP TANK | ▭ | GAL | | | | | | |
| TWO WAY CLEANOUT | ●● | 4" | PVC | 1 | 30.7' | 30.9' | | |
| | | | | | 31.2' | 31.5' | | |
| ONE WAY CLEANOUT | ● | | | | | | | |
| FREEZELESS RISER | Ⓕ | | | | | | | |
| WATER SERVICE LINE | —— W —— | | | | | | | |
| SEWER SERVICE LINE | —— S —— | | | | | | | |
| DRAIN FIELD | ▭▭▭▭▭ | | HDPE | 42 | | | | |
| PERFORATED PIPE | —— | | | | | | | |
| SEWER FORCE MAIN | —— SFM —— | | | | | | | |
| INSULATION | ▨ | | | | | | | |
| BURIED ELECTRICAL LINE | —— E —— | | | | | | | |
| WATER MAIN | —— W/M —— | | | | | | | |
| SEWER MAIN | —— S/M —— | | | | | | | |

DISPOSAL SYSTEM

TYPE: ☒ CONVENTIONAL
☐ IN-GROUND
☐ AT-GRADE
☐ MOUND

MATERIAL: INFILTRATOR CHAMBERS
DIMENSIONS: 9' x 90'

DRAWN BY: TLR
DATE: 02-16-06
COMPANY:
ABC COMPANY

REMARKS:
DRAINFIELD IS
DESIGNED FOR A
4 BEDROOM HOME

INSTALLED QUICK4
STANDARD CHAMBERS

FACILITIES INSTALLED
IN FEBRUARY 2006

DRAWING NO.
01780-2 (EXAMPLE)

USER: jzierden FILE: I:\STANDARD DETAILS\CSI-SPECS\2012\01780-1.dwg 12/14/2012 - 9:19am

# SECTION 02310
# GRADING

## PART 1 - GENERAL

1.01 SUMMARY

A. This section includes rough and finished site grading of all areas disturbed during construction.

1.02 RELATED WORK

A. Section 02315 – Excavation, Trenching and Backfill
B. Section 02370 – Temporary Erosion and Sediment Control
C. Section 02920 – Topsoiling, Seeding, Fertilizing and Mulching

## PART 2 – PRODUCTS (Not applicable)

## PART 3 - EXECUTION

3.01 ROUGH GRADING

A. Grade the area in the vicinity of the excavation to prevent surface water from flowing into the excavation.

B. Maintain existing drainage.

3.02 FINISH GRADING

A. Grade site to true grades as specified on the plans after all structures and piping have been installed.

B. Grade sites for effective drainage away from structures.

C. Dress and trim all slopes.

**END OF SECTION**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# SECTION 02315
# EXCAVATION, TRENCHING, AND BACKFILL

## PART 1 - GENERAL

### 1.01 SUMMARY

A. This section includes excavation, trenching and backfill necessary for the construction of the facilities as indicated on the plans including, but not limited to: water mains and service lines, sewer mains and service lines, concrete manholes, septic tanks, and other structures.

### 1.02 RELATED WORK (as applicable)

A. Section 01780 – Closeout Submittals
B. Section 02310 – Grading
C. Section 02370 – Temporary Erosion And Sediment Control
D. Section 02512 – Individual Water Systems
E. Section 02920 – Topsoiling, Seeding, Fertilization and Mulching

### 1.03 REFERENCES

A. Manual on Uniform Traffic Control Devices.

B. ASTM D698 – Test Methods for Moisture Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb. Rammer and 12-in. Drop [Standard Proctor Test].

C. ASTM D2321 – Underground installation of Flexible Thermoplastic Sewer Pipe.

D. ASTM D2487 – Classification of Soils for Engineering Purposes [Unified Soil Classification System].

E. OSHA – Occupational Safety and Health Standards 1910 and 1926.

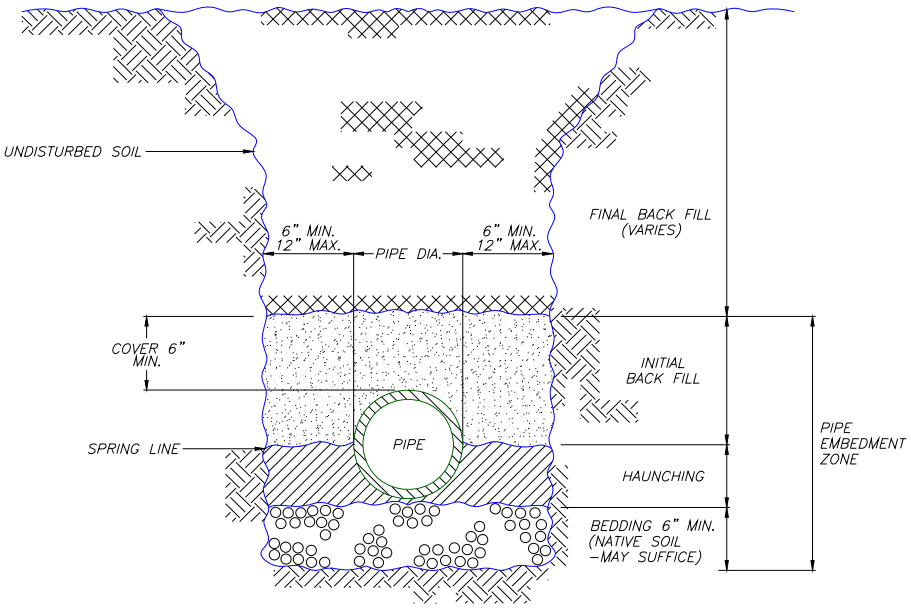
### 1.04 SUBMITTALS

A. Polystyrene Insulation

B. Polyethylene Encasement (as applicable)

### 1.05 DEFINITIONS

A. Bedding, Haunching and Initial Backfill zones as defined herein and on the standard pipe trench detailed drawing below:




PIPE TRENCH DETAIL

B. Soil Materials as summarized in the table below and defined in ASTM D2321 and ASTM D2487

*Description and Comparison of Soil Material Classifications*

| *ASTM D2321* | | *ASTM D2487* | |
|---|---|---|---|
| *Class* | *Type* | *USCS Group Symbol* | *Description* |
| IA | Manufactured aggregates: ¼ to 1 ½ inch open graded, clean. | * *None* | Closest to "Poorly graded gravel (GP)" |
| IB | Manufactured aggregates: ¼ to 1 ½ inch dense graded, clean. | * *None* | Closest to "Poorly graded gravel with sand (GP)" |
| II | Coarse sands and gravels with maximum particle size of 1 ½ inch, clean. | GW | Well-graded gravels and gravel-sand mixtures; little or no fines. |
| | | GP | Poorly graded gravels and gravel sand mixtures; little or no fines. |
| | | SW | Well-graded sands and gravelly sands; little or no fines. |
| | | SP | Poorly graded sands and gravelly sands; little or no fines |
| | Coarse sands and gravels with maximum particle size of 1 ½ inch, borderline clean. | GW-GC<br>SP-SM<br>Etc. | Sands and gravels which are borderline between clean and with fines |
| III | Fine sand and clayey gravels. | GM | Silty gravels, gravel-sand-silt mixtures. |
| | | GC | Clayey gravels, gravel-sand-clay mixtures |
| | | SM | Silty sands, sand-silt mixtures |

| | | | |
|---|---|---|---|
| | | SC | Clayey sands, sand-clay mixtures |
| IV | Fine grained soils (inorganic) | ML | Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, silts with slight plasticity. |
| | | CL | Inorganic clays of low to medium plasticity, gravely clays, sandy clays, silty clays, lean clays. |
| | | MH | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts. |
| | | CH | Inorganic clays of high plasticity, fat clays. |
| V | Organic soils | OL | Organic silts and organic silty clays of low plasticity. |
| | | OH | Organic clays of medium to high plasticity, organic silts. |
| | | PT | Peat and other high organic soils. |

* USCS system is limited to naturally occurring soils. Manufactured aggregates not covered.

## PART 2 – PRODUCTS

2.01 BEDDING, HAUNCHING AND INITIAL BACKFILL MATERIAL

A. Class I, Class II or Class III, utilized in accordance with restrictions described in Part 3 - Execution.

2.02 INSULATION

A. Rigid extruded polystyrene insulation board, having a minimum compressive strength of 25 psi.

B. Width:

1. 4-foot for mains 6-inch (nominal diameter) and larger.

2. 2-foot for mains and service lines less than 6-inches (nominal diameter).

C. Thickness: As stipulated on the bid schedule.

2.03 POLYETHYLENE ENCASEMENT

D. Minimum 8 mils thickness.

## PART 3 - EXECUTION

3.01 GENERAL

A. Trenching and excavation work shall be done in accordance with proper emphasis on safety as determined by the Contractor to conform to recommended safety standards such as OSHA 1910 and 1926.

B. Obtain all permits from appropriate road agency for construction within road right of way.

C. Repair damage resulting from settlement, slides, cave-ins, water pressure, and other causes.

D. Provide adequate signs, barricades, fences and amber lights and take all necessary precautions to protect the work and the safety of the public in all construction areas.

1. Placement of construction signs and barricades shall conform to the “Manual on Uniform Traffic Control Devices.”

2. Protect barricades and obstructions at night by amber signal lights that burn from sunset to sunrise. Barricades shall also be of substantial construction, painted white or with reflective paint to increase their visibility at night.

3. Perform work without obstruction to traffic or inconvenience to the general public and the residents in the vicinity of the work.

E. Road Crossing

1. Comply with all construction and material requirements of roadway authorities having jurisdiction.

2. Maintain one lane of traffic open at all times.

3. Refer to Section 02705 – Road Restoration for backfill and restoration requirements.

## 3.02 EXCAVATION

A. Remove trees and stumps from excavation and site.

B. Remove and stockpile existing topsoil.

C. Install facilities as staked unless otherwise approved by Engineer.

D. Maintain surface drainage away from trenching or excavation.

E. Remove unsuitable foundation materials from excavation as shown on the plans or as authorized by the Engineer.

F. Maintain a minimum 1-foot clearance between outer surface of structure being installed and wall of excavation.

G. Rock encountered shall be classified, excavated and measured in accordance with Section 02316 – Rock Excavation

## 3.03 TRENCHING

A. Bottom width: No less than 12 inches or more than 36 inches wider than the outside diameter of the pipe.

B. Depth: Provide minimum cover as specified, or depths shown on plans.

## 3.04 BEDDING

A. If existing soil cannot provide uniform, stable bearing support, over-excavate 6 inches below bottom of pipe or structure and provide bedding material.

B. Utilize Class I, II or III materials as appropriate for bedding as listed in Table below.

*Use of Soils and Aggregate for Bedding*

| | *Class IA* | *Class IB* | *Class II* | *Class III* |
|---|---|---|---|---|
| General | Excellent pipe support. Excellent drainage. | Excellent pipe support. Good drainage. Minimizes migration of adjacent material. | Good pipe support. Fair drainage. | Reasonable pipe support. Poor drainage |
| Compaction | Not required | Not required | Required 90% of Standard Proctor. | Required 90% of Standard Proctor. |
| Wet Conditions (below current or future water table). Rock Cuts | Acceptable. Must use same material for Haunching. | Acceptable. Must use same material for Haunching. | Acceptable. Clean groups only suitable for drainage blanket. | Not- Acceptable |
| Dry Conditions | Acceptable | Acceptable | Acceptable | Acceptable |

## 3.05 HAUNCHING AND INITIAL BACKFILL

A. General

1. Provide complete and uniform bearing and support for the pipe, including allowance for bell holes, or structure.

2. Work material under and around the pipe to ensure full pipe support.

3. Prevent movement of the pipe during placement of material.

4. Avoid contact between the pipe and mechanical compaction equipment.

B. Utilize Class I, II or III materials as appropriate for haunching and initial backfill as listed in Table below. No frozen materials or frozen clods.

*Use of Soils and Aggregate for Haunching and Initial Backfill*

| | *Class IA* | *Class IB* | *Class II* | *Class III* |
|---|---|---|---|---|
| General | Excellent pipe support. Excellent drainage. Install to a minimum of 6" above the pipe crown. | Excellent pipe support. Good drainage. Minimizes migration of adjacent material. Install to a minimum of 6" above the pipe crown. | Good pipe support. Fair drainage. Install and compact to a minimum of 6" above the pipe crown. | Reasonable pipe support. Poor drainage. Install and compact to a minimum of 6" above the pipe crown. |
| Compaction | Not required | Not required | Required 85% of Standard Proctor. 6 inch maximum lifts. | Required 90% of Standard Proctor. 6 inch maximum lifts. |
| Wet Conditions (below current or future water table). Rock Cuts | Acceptable. Must use same material for Bedding. Extend Haunching to the top crown of the pipe. | Acceptable. Must use same material for Bedding. Extend Haunching to the top crown of the pipe. | Acceptable. Clean groups only suitable for drainage. | Not- Acceptable |
| Dry Conditions | Acceptable | Acceptable | Acceptable | Acceptable |

## 3.06 FINAL BACKFILL

A. Backfill remainder of excavation with native material, free from large clods, large stones, organic material or frost chunks unless otherwise specified below.

B. Backfill within roadways, driveways, and shoulders.

1. Conform to Section 02705 – Road Restoration for backfill requirements under roadways, driveways, and shoulders.

C. Backfill around structures.

1. Backfill and compact around manholes, valve boxes, and other appurtenances in 12-inch lifts.

   a. Compact with a mechanical tamper to a density not less than 90% of the maximum dry density, determined by ASTM D 698.
   b. Compaction around structures in roadways, driveways, and shoulders shall conform to Section 02705.

2. Backfill around septic tanks in 18-inch lifts.

   a. Compact in a manner that will not produce undue strain on the tank.

b. Compaction may be accomplished with the use of water, provided the material is thoroughly wetted from the bottom up, and the tank is filled with water to prevent floating.

D. Backfill of trenches and other locations not listed above.

1. Compact in 18-inch lifts to a density not less than the density of the surrounding undisturbed soil.

2. Provide 3 feet minimum of backfill over the pipe before wheel loading the trench.

3. Provide 4 feet minimum cover over the top of the pipe before utilization of hydrohammer compaction equipment.

4. Compact in smaller lifts if the required compaction cannot be obtained.

5. Lifts may be increased at the discretion of the Project Engineer if required compaction can be obtained.

E. Repair any trenches improperly backfilled or where settlement occurs, then refill and compact.

F. Restore surface to the required grade and compaction. Conform to Section 02310 – Grading for rough grading, finish grading and site surface drainage.

G. Remove all surplus backfill materials to a location approved by the Engineer.

## 3.07 FROST PROTECTION

A. Place insulation in areas where water main, sewer service lines or water service lines cross a road, driveway, traveled path, as indicated on the plans or as directed by the Engineer.

B. Center insulation over the main with no more than 6 inches of compacted fill between the pipe and the insulation. Grade fill so insulation lays flat.

C. Maintain a straight alignment of insulation.

D. Extend insulation a minimum of 5 feet on each side of the crossing.

E. Lap insulation by 6 inches or stagger by 6 inches if composed of two layers.

F. Minimum thickness for the first lift of backfill over the insulation is 8 inches.

1. Do not operate construction equipment directly on insulation. Do not compact first lift with backhoe-mounted compactor, or any other large compaction equipment.

2. Compact remaining backfill using normal construction practices.

## 3.08 POLYETHYLENE ENCASEMENT

A. All metallic mainline pipe, fittings, and appurtenances installed in aggressive soils shall be wrapped with polyethylene in accordance with ANSI/AWWA C105/A21.5.

B. The wrap shall extend 2-feet beyond all metallic fittings/appurtenances and cover the entire length of metallic pipe. All rips or punctures shall be repaired with tape or by rewrapping that area with polyethylene film.

C. After assembling the pipe joint, the polyethylene shall be overlapped approximately 1-foot and at all joints sealed with approved adhesive tape. Additional taping shall be used at 3-foot intervals along the pipe. All copper service connections shall be wrapped for a distance of 3-feet from the center line of the main. Before installing the polyethylene wrap, the exterior of the pipe shall be free of foreign material.

## 3.09 REMOVAL OF NUISANCE WATER

A. Remove nuisance water entering the trenches. Nuisance water that can be removed through the use of sump or trash pumps is not considered dewatering.

B. Keep trenches free from water until the facilities are in place, sealed against the entrance of water, and backfill has been placed and compacted above the water level.

## 3.10 LOCATE EXISTING UTILITIES

A. Field locate all existing underground utilities.

1. Utilize state “dig-safe” or “one-call” hotlines.

2. Contact all other utility owners not covered by the state “dig safe” hotlines.

## 3.11 UTILITY CONFLICTS

A. Protect existing utilities from damage during excavation and backfilling operations.

B. Provide temporary support for existing water, gas, telephone, power, or other utility services that cross the trench until backfilling of trench is complete

1. Compact backfill to 95% of Standard Proctor Density under disturbed utilities.

2. Repair or replace any damaged existing utilities, at no additional cost to the project.

C. Water and sewer main crossing and parallel installation

1. Maintain a 10 foot horizontal separation (O.D. to O.D.) for parallel mains.

2. Upon approval by the Engineer, water and sewer mains may be installed closer than 10 feet, provided all of the following conditions;

   a. Vertical separation is 18 inches (O.D. to O.D.)
   b. Water main is above the sewer main.
   c. Separate trenches are maintained.

3. Maintain a minimum 18-inch vertical separation (O.D. to O.D.) for crossing mains.

   a. Lay pipe with joints equidistant from the point of crossing.

4. If it is impossible to meet any of the above separation distances and deviations, one of the following methods shall be adhered to.

   a. Sewer main shall be constructed to water main pressure pipe standards, and successfully pass a 150-psi pressure test prior to backfilling.
   b. Either the water main or the sewer main may be encased in a watertight carrier pipe that extends 10 feet on both sides of the crossing. The carrier pipe shall be of materials approved by the regulatory agency for use in water main construction.

D. Water and sewer service crossing and parallel installation.

1. Maintain a 30-inch horizontal separation from water and sewer services.

2. Maintain a 12-inch vertical separation for crossing water and sewer services.

3. Water service line splices or joints will not be permitted within 10 feet of a sewer line crossing.

## 3.12 MOVING FENCES AND MINOR STRUCTURES

A. Remove and reset culverts, drainage pipes or other minor structures that fall within the alignment of the new construction, to their original location and grade.

B. Visit the project site and determine actual conditions with regard to the existence of old car bodies, abandoned houses, fences, driveways, trees, stumps, brush, sidewalks, approaches, and other miscellaneous obstacles to construction.

    1. Unless specifically referenced in a bid item, no separate payment will be made for the removal or replacement of these items.

3.13 RECORDS

A. Conform to as-built requirements in Section 01780 – Closeout Submittals.

**END OF SECTION**

# SECTION 02370
# TEMPORARY EROSION AND SEDIMENT CONTROL

## PART 1 - GENERAL

### 1.01 SUMMARY

A. This section includes temporary erosion and siltation control measures accomplished through the use of silt fences, hay bales, erosion mats and other erosion control devices or methods.

### 1.02 RELATED WORK (as applicable)

A. Section 02310 – Grading
B. Section 02315 – Excavation, Trenching and Backfill
C. Section 02920 – Topsoiling, Seeding, Fertilizing and Mulching

### 1.03 REFERENCES

A. Minnesota Pollution Control Agency – Best Management Practices Handbook

B. Environmental Protection Agency - 1987 Congressional Amendments, Clean Water Act, Section 402.

### 1.04 SUBMITTALS

A. Method of Erosion Control
B. Silt Fence and Appurtenances
C. Erosion Mats and Appurtenances
D. Erosion Control Plan (If requested by the Engineer)

### 1.05 QUALITY ASSURANCE

A. Erosion control materials, methods and practices shall conform to the applicable state agency handbooks of Best Management Practices, or tribal laws established for the purpose of erosion control on construction sites.

B. Obtain and pay for permits and inspections in accordance with the provisions of all local government agencies having jurisdiction. No additional claim for compensation will be allowed because of the Contractor's failure to obtain or pay for such permits and inspections.

## PART 2 - PRODUCTS

### 2.01 SILT FENCING

A. Applicability

1. Heavy Duty: General use during site grading to protect critical areas and bodies of water.

2. Standard: Light-duty applications to protect temporary construction or to supplement the other types of silt fence.

3. Machine-slice: For most applications.

B. Geotextile properties:

| Description | Heavy Duty | Standard | Machine Slice |
|---|---|---|---|
| Type | Woven | Woven | Monofilament |
| Width | 48 inches | 36 inches | 36 inches |
| Grab Tensile Strength (ASTM D 4632) | 100 lb Min | 100 lb Min | 130 lb Min |
| Apparent Opening Size (ASTM D 4751) | 20-70 Sieve | 20-70 Sieve | 30-40 Sieve |
| UV Stability (ASTM D 4355 500 hr) | 70% Min | 70% Min | 70% Min |
| Top-fastening Component | Overlap around woven wire backing | Sewn-In cord | |

* From Minnesota BMP

C. Net Backing

| Description | Heavy Duty | Standard | Machine Slice |
|---|---|---|---|
| Material | Woven wire | N/A | N/A |
| Min. Weight | 14-1/2 gauge | | |
| Min. Mesh Opening | 2 inches | | |
| Max Mesh Opening | 6 inches | | |
| Min. Width | 30 inches | | |
| Tensile Strength (ASTM D 4595) | 100 lb/ft | | |
| UV Stability (ASTM D 4355 500 hr) | 70% Min | | |

* From Minnesota BMP

D. Post properties:

| Description | Heavy Duty | Standard | Machine Slice |
|---|---|---|---|
| Material | Metal | Wood | Metal |
| Min. Size | 1.25 lb/ft | 1.5 inch x 1.5 inch | 1.25 lb/ft |
| Min. Length | 5 feet | 4 feet | 5 feet |
| Min. Embedment | 2 feet | 1.5 feet | 2 feet |
| Max. Spacing | 8 feet | 8 feet | 6 feet |
| Type of Post Fasteners | U-shaped clips. No. 16 gauge wire | Gun staples 0.5 inch long | Plastic zip ties (50lb tensile strength) |
| Min. Fasteners per Post | 3 | 5 | 3 |

* From Minnesota BMP

E. All seams shall be heat sealed or sewn

## 2.02 EROSION BALES

A. Applicability: Can be used in locations where silt fencing is used.

B. Rectangular clean hay bales or straw bale.

C. Posts: Wood or steel, 2” x 2” x 54” minimum.

2.03 EROSION CONTROL MATS

A. Biodegradable or photodegradable erosion control mat equal to American Excelsior Curlex II with a minimum 4-foot mat width.

2.04 OTHER

A. Other materials proposed by the Contractor shall conform to standards published by the applicable state agency handbooks of Best Management Practices (BMP’s).

**PART 3 – EXECUTION**

3.01 GENERAL

A. Coordinate temporary and permanent erosion control measures to assure economical, effective and continuous erosion control.

B. Keep construction areas small.

C. Divert drainage away from construction areas.

D. Perform construction in and adjacent to rivers, streams, lakes or other waterways in such a manner as to avoid washing, sloughing or deposition of material into waterways which will result in undue or avoidable contamination, pollution or siltation of such waterways.

E. Inspect and maintain erosion control materials to ensure its continued effectiveness.

1. Remove sediment material captured by erosion control systems before systems fails.

2. Inspect and repair erosion control systems within 48 hours of rain event.

F. Remove erosion control only after the area has stabilized and vegetation has developed to the extent that further erosion is unlikely.

G. Submit a plan for erosion control measures that are in compliance with State BMPs and/or Federal EPA requirements, if the area to be disturbed is greater than one (1) acre total.

3.02 TEMPORARY EROSION CONTROL

A. Use temporary erosion control measures to protect ditches and drainage ways as shown on the detailed drawings and as directed by the Engineer.

B. Silt fencing (in lieu of or in combination with erosion bales)

1. Install silt fence in accordance with manufacturer's recommendations.

2. Construct the silt fence as shown on the plans and/or install on the contour of the slope.

3. Place silt fences in an arc or horseshoe shape with the ends pointing up towards the slope.

4. Maximum drainage area = ¼ acre per 100 feet of fence

5. Installation limitations:

| Slope Steepness | Maximum Slope Length |
|---|---|
| 2:1 (50%) | 15 feet |
| 3:1 (33%) | 15 feet |
| 4:1 (25%) | 15 feet |
| 5:1 (20%) | 25 feet |
| 10:1 (10%) | 50 feet |
| 20:1 (5%) | 75 feet |

6. Compact the soil immediately next to the silt fence fabric.

7. Clean silt fence when sediment reaches 1/3 height of the silt fence.

C. Erosion Bales

1. Install hay bales as shown on the plans and/or install on the contour of the slope.

2. Installation limitations:

| Slope Steepness | Maximum Slope Length |
|---|---|
| 2:1 (50%) | 15 feet |
| 3:1 (33%) | 15 feet |
| 4:1 (25%) | 15 feet |
| 5:1 (20%) | 25 feet |
| 10:1 (10%) | 50 feet |
| 20:1 (5%) | 75 feet |

3. Install hay bales in 4-inch deep trench.

4. Place bales at right angles to the direction of flow.

5. Securely anchor each bale with stakes as shown on the plans.

6. Compact soil on the upslope side of the hay bales.

7. Fill gaps between bales with straw.

8. Clean sediment away from bale when sediment reaches 1/2 height of the hay bale.

9. Replace damaged, destroyed or rotted bales immediately.

10. Bales may be used for mulching material if they meet the specifications of Section 02920.

D. Erosion Control Mats

1. Where indicated on the plans, by the Project Engineer, or on slopes greater than 5%, use a wood fiber mat in lieu of mulch.

2. Install in accordance with manufacturer’s recommendations

3. Roll matting strips in the direction of the flow.

4. Spread mat evenly, smoothly, and in a natural position without stretching and with all parts touching the soil.

**END OF SECTION**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**SECTION 02541**
**PRESSURE DOSED MOUND SYSTEM**

## PART 1 - GENERAL

### 1.01 SUMMARY

A. This section includes construction of a pressurized, above-ground wastewater disposal system from the pump tank to the soil treatment area.

### 1.02 RELATED WORK (as applicable)

A. Section 01780 – Closeout Submittals
B. Section 02315 – Excavation, Trenching and Backfill
C. Section 02545 – Concrete Septic Tank and Piping
D. Section 02920 – Topsoiling, Seeding, Fertilizing, and Mulching

### 1.03 REFERENCES

A. ASTM C 33 – Standard Specification for Concrete Aggregates

B. ASTM D1785 – Polyvinyl Chloride (PVC) Plastic Pipe Schedule 40, 80, and 120

C. ASTM D1785 - Polyvinyl Chloride (PVC) Plastic Pipe Schedule 40 Insulated Pipe

D. ASTM D2241 – Polyvinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series)

E. Minnesota Pollution Control Agency, Minnesota Rules Chapter 7080 – Subsurface Sewage Treatment Systems Program

F. National Electric Code (NEC)

### 1.04 SUBMITTALS

A. Pump tank, riser, cover, and safety screen
B. Effluent pump, controls, and alarm system
C. Force Main, manifold, and lateral piping and fittings
D. Source and gradation of drainfield gravel
E. Source and sieve analysis for clean sand
F. Geotextile fabric
G. Gravel-less drainfield distribution media (if required)

### 1.05 QUALITY ASSURANCE

A. Mound materials and construction practices shall meet Minnesota Rules Chapter 7080 requirements if not otherwise specified in this Section.

## PART 2 - PRODUCTS

### 2.01 CONCRETE PUMP TANK

A. Material: Watertight, reinforced concrete

B. Size: Volume of container shall be listed in the design or bid schedule.

C. Must comply with applicable state requirements. Refer to Section 02545 for appropriate state references.

D. Combination septic /pump tanks that meet applicable state requirements are acceptable.

E. Manhole risers and covers

1. Provide at least one manhole opening, no less than 24 inches in diameter, situated over the pump.

2. Manhole riser shall be cast in place polyethylene with gasketed connections or other approved water-tight material.

3. Covers shall be of the same material as the riser with a warning label printed with information regarding the hazards present when entering a septic tank affixed or supplied by the manufacturer.

4. Cover shall be secured to the riser with locking screws or approved equal.

F. Manhole Safety ScreenSafety screen shall be a Polylok 24 inch safety screen #3008-SS or approved equal.

1. Made of yellow ABS plastic with built in handle, to fit 24 inch Polylok manhole riser sections.

2. Unit to be rated and tested for 250 pounds per square foot.

3. Screen shall be installed per manufacturer instructions inside the top riser section that connects to cover dome facing up.

### 2.02 PUMPS AND CONTROLS

A. Effluent Pump

1. Size: Total dynamic head and flow requirements shall be listed in the design by the Engineer.

2. Equal to Peabody Barnes Model EH522, Myers Model ME 50, Goulds Model 3885 or Zoeller 270.

3. The pump motor shall have a built-in thermal overload protection with automatic reset.

B. Power Supply

1. 120/240 volt, single phase, three-wire service from one/two pole breaker off lighting panel in the residence on a separate/dedicated circuit.

2. Use wire sized in accordance with NEC.

C. Pump Controls

1. Furnish and install controls to operate the pump based on on-off level control floats.

2. Option #1: A control panel compatible with the pump supplied.

   a. Enclosure: Weatherproof NEMA 4X fiberglass

   b. Pump Control: Hand-Off-Auto switch

   c. Circuit breakers for pump and alarm

   d. Provide terminal blocks for connection of on-off level control floats.

   e. Equal to Rhombus Model 112 Control Panel or Rhombus EZ Series Single Phase Simplex

3. Option #2: Pump Switch with Piggy-Back Plug and outlet rated for exterior use

   a. Enclosure: Weatherproof NEMA 4X fiberglass

   b. Size pump switch to be compatible with selected pump.

   c. Enclosure area shall be a minimum of 1.5 times the area of the piggyback switch, outlet, and folded cables.

   d. Equal to Rhombus Double Float pump switch.

D. Floats

1. Install two mechanical float switches to detect on-off control levels for the pump.

2. Use SJE Rhombus Signal Master Control Switch or equal.

E. Alarm

1. Provide an alarm system on a separate circuit from the pump.

2. Visual warning: Red beacon

3. Audible warning: Horn at 80-90 decibel rating

4. Switch: Alarm test and horn silence

2.03 ELECTRICAL CABLE

A. Electrical cable shall be type UF for direct burial.

B. Use two separate wires for the effluent pump and for the float switches.

C. Size underground cable to limit voltage drop from power source to pump motor in accordance with pump manufacturer's recommendations.

2.04 FORCE MAIN AND LATERAL PIPING

A. Force Main Pipe

1. Material: Schedule 40 PVC must conform to ASTM D 1785.

2. Material: 160 psi SDR 26 PVC must conform to ASTM D 2241.

3. Size: Diameter shall be indicated on design drawings.

4. Insulated pipe may be used if approved by the Engineer:

a. Material: Insulated Schedule 40 PVC with 6-mil polyethylene protective sleeve. Must conform to ASTM D 1785.

b. Insulation: R-value of 13 and 6-inch diameter of urethane foam.

c. Other: Belled ends and solvent joints.

B. Manifold Pipe

1. Material: Schedule 40 PVC must conform to ASTM D 1785.

2. Material: 160 psi SDR 26 PVC must conform to ASTM D 2241.

3. Size: 2 inch diameter unless otherwise indicated in design drawings.

C. Lateral Pipe

1. Material: Schedule 40 PVC must conform to ASTM D 1785.

2. Material: 160 psi SDR 26 PVC must conform to ASTM D 2241.

3. Size: Diameter shall be indicated on design drawings.

4. The pipe shall be field perforated.

5. Lateral cleanouts shall be Schedule 40 PVC or SDR 26 PVC.

6. Lateral cleanout caps shall be Schedule 40 PVC with PVC adapter and screw type plug or a female threaded cap.

7. Lateral cleanouts shall be installed with an insulated access box or 4 inch PVC cover pipe with cap.

2.05 MOUND MATERIALS AND DISTRIBUTION MEDIA

A. Clean sand shall meet the following requirements for fine aggregate (ASTM C33):

| Sieve No. | Percent Finer by Weight |
|---|---|
| 3/8 inch | 100% |
| No. 4 | 95-100% |
| No. 8 | 80-100% |
| No. 16 | 50-85% |
| No. 30 | 25-60% |
| No. 50 | 10-30% |
| No. 100 | 2-10% |
| No. 200 | 0-3% |

B. Distribution Media Options: Shall be determined by Engineer and indicated on design drawings and bid schedule.

1. Drainfield Gravel: Gravel shall be clean and may vary in size from 3/4-inch to 1-1/2 inches not to exceed 5 percent fines.

2. Infiltrators Systems Inc., Quick 4 Standard Chambers

3. Infiltrators Systems Inc., Quick 4 Plus Standard Low Profile (LP) Chambers

4. Infiltrators Systems Inc., Quick 4 High Capacity (HC) Chambers

5. Infiltrators Systems Inc., EZ Flow Systems

C. Fill material may be subsoil if it is not heavy clay or glacial till with stones and boulders. Sandy loam is the preferred material.

2.06 GEOTEXTILE FABRIC

A. Material: Synthetic, nonwoven material shall be TYPAR Style 3151 or approved equal.

2.07 OBSERVATION PIPE

A. Material: Schedule 40 PVC

B. Size: 4-inch diameter

C. Observation pipe caps shall be 4-inch Schedule 40 PVC with PVC adapter and screw type plug or female threaded cap.

D. Cap shall be non-vented plastic.

**PART 3 - EXECUTION**

3.01 GENERAL

A. Construct mound in accordance with Minnesota Rules 7080 and Engineer's design.

B. If changes to mound are found to be necessary at the time of construction, notify Engineer immediately for approval or redesign.

3.02 CONCRETE PUMP TANK AND PUMP

A. Install 4-inch Schedule 40 PVC from the septic tank to pump chamber.

B. Seal all joints between inlet piping, vent pipe, riser, etc. to eliminate ground water infiltration.

C. Extend risers 3 to 6 inches above finished grade.

3.03 CONTROL PANEL AND ALARM SYSTEM

A. Install all wiring in accordance with the NEC.

B. Install all buried electrical cable (1 pump wire and 3 float switch wires) in one trench.

C. Mount control panel in a location specified by the Engineer.

D. Seal all conduit openings entering the control panel and pump chamber with silicone caulk or other appropriate material.

E. Install outdoor alarm system with control panel. If indoor alarm system is specified, then install in a location selected by the Engineer and homeowner.

1. Install the alarm system on a separate circuit from the pump.

2. High level warning shall activate audible and visual alarm.

3. Provide a silence switch that will silence the audible alarm and allow the visual alarm to remain energized.

4. The high alarm sensor shall continue to show an alarm condition until the operating condition has returned to normal and the silencing switch has been returned to its “normal” position.

3.04 FORCE MAIN, MANIFOLD, AND LATERAL PIPING

A. Install force main piping and union in the pump chamber as shown in the detail drawings to allow the removal of the pump through the riser by only disconnecting the union.

1. Union shall be a maximum of 24 inches below top of tank riser.

B. Alternative discharge piping layout: exit through the pump tank opening.

1. Discharge piping shall be brought up into the riser so that the union is within 24 inches of the top of the tank riser.

2. Drill a 1/4-inch weep hole in the bottom elbow of the outlet pipe.

C. Slope force main continuously up to the mound manifold unless otherwise directed by the Engineer. Slope shall be a 1/8 inch per foot or minimum of 6 inches to ensure drainback of force main to the pump tank.

D. Trench force main pipe up to the mound area and slope into the mound from the upslope side or the end of the mound per the design drawings.

E. Pressurized Lateral Piping:

1. Install piping per design and as shown in the drawings.

2. Field perforate laterals using sharp drill bit. Perforation diameters and spacing shall be indicated in design drawings.

3. Remove all burrs and filings from the interior of the pipe.

F. Lateral cleanouts:

1. Located at the terminal end of each lateral.

2. Accessible from final grade

3. Large enough to allow access to caps or plugs with hands, tools, etc.

G. Refer to Section 02315 for excavation and backfilling procedures.

## 3.05 MOUND SURFACE PREPARATION

A. Remove excessive vegetation from the mound area by clearing and mowing.

B. If tree removal is required, cut trees flush with the ground and remove from site. Leave stumps in the ground.

C. Mound absorption area shall be roughened to a depth of 8 inches and perpendicular to the slope with backhoe teeth or plow.

1. Do not compact or mix soil.

2. Never use a rototiller.

## 3.06 MOUND CONSTRUCTION

A. Application of clean mound sand must be completed immediately after surface roughening has been accomplished.

B. Place a minimum of 12 inches of clean sand below drainfield gravel.

C. Place sand by dumping from the upslope side and ends of the roughened area.

D. Use tracked equipment to spread the sand and keep at least 6 inches of sand under the tracks at all times.

E. Distribution Media Construction:

1. Gravel:

a. Place gravel the full width of the trench and lay perforated pipe level.

b. Gravel shall be 2 inches above the pipe and 6 inches below the pipe unless otherwise indicated by Engineer.

c. Cover the top of the gravel bed with geotextile fabric.

2. Gravel-less Distribution Media: Install media approved by the Engineer as shown on the detail drawings and according to manufacturer specifications.

a. Install observation pipe on each gravel-less drainfield lateral end.

i. Chambers: Insert observation pipe through 4-inch punch-out hole on top of the end drainfield chamber.

ii. EZ Flow: Install observation pipe in accordance with 3.07.

F. Refer to 3.04 for manifold and lateral piping installation requirements.

G. Place fill material above the drainfield gravel as shown on the detail drawings.

1. The fill material layer shall be a minimum of 12 inches deep at the center of the mound and a minimum of 6 inches deep at the sides.

H. Cover the entire mound with a minimum of 6 inches of topsoil.

D. Seed and mulch entire mound area to provide immediate erosion control. Refer to Section 02920 for Topsoiling, Seeding, Fertilizing, and Mulching requirements.

I. Repair erosion damage and re-seed the mound area as required until a complete vegetation cover is achieved.

3.07 OBSERVATION PIPE

A. Install an observation pipe on the downslope side. Install a second observation pipe in between the 2 laterals on the upslope side and opposite end from the downslope observation pipe.

B. Drill a minimum of 2 holes in observation pipe located within the distribution media zone. Holes shall be a minimum of 3/8” in diameter and no more than 6 inches apart vertically.

C. Install a piece of 1/4” to 3/8” diameter rebar through bottom of observation pipe to anchor pipe in distribution media.

D. The observation pipe shall extend from the bottom of the trench to a height of 12 to 24 inches above grade.

3.08 FIELD QUALITY CONTROL

A. No roughening shall take place when the moisture content of the soil is such that rolling a sample between the hands forms a roll 1/8 inch in diameter.

B. The Engineer reserves the right to conduct a field test of mound sand and reject the aforesaid sand should it fail to meet the gradation requirements.

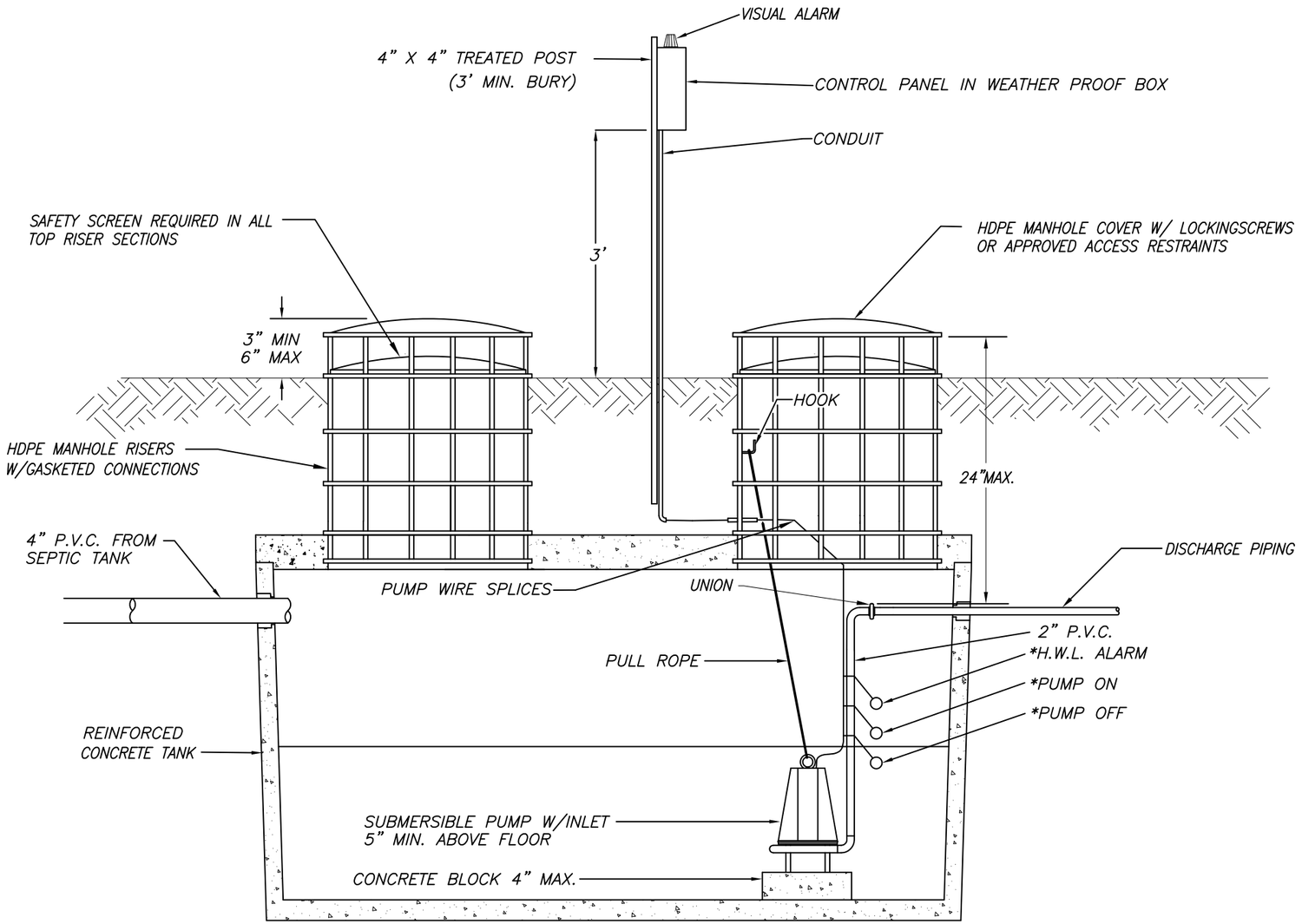
C. No rubber tired or wheeled equipment or material stockpiles will be allowed on the mound soil treatment area and the designated down-slope area.

D. Draw-down test may be requested by the Engineer.

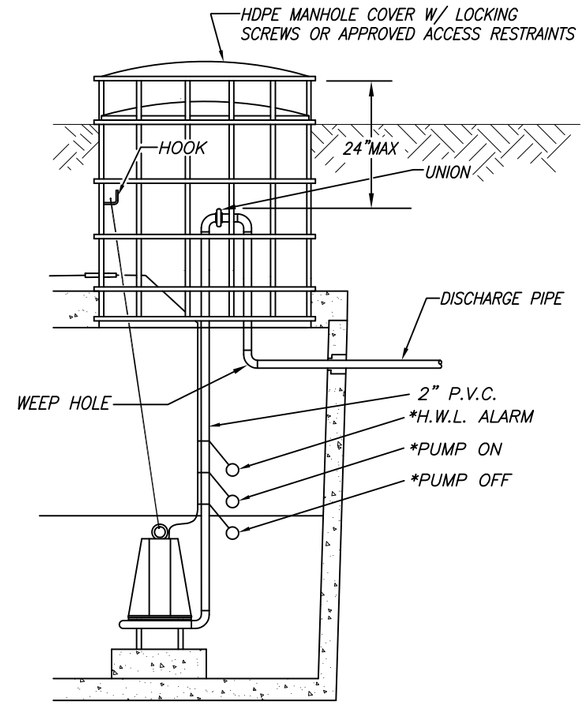
3.07 AS-BUILTS

A. Provide as-built information on each system in accordance with Section 01780.

**END OF SECTION**




STANDARD DISCHARGE PIPING
N.T.S.




ALTERNATE DISCHARGE PIPING
N.T.S.

NOTES:

1.) FLOAT SETTINGS TO BE SPECIFIED BY THE PROJECT ENGINEER.

2.) DISTANCE FROM ELBOW TO THE TOP OF THE RISER IS A MAX. OF 24" OR OPTIONAL PIPING SHALL BE USED.

THIS DRAWING NOT TO SCALE

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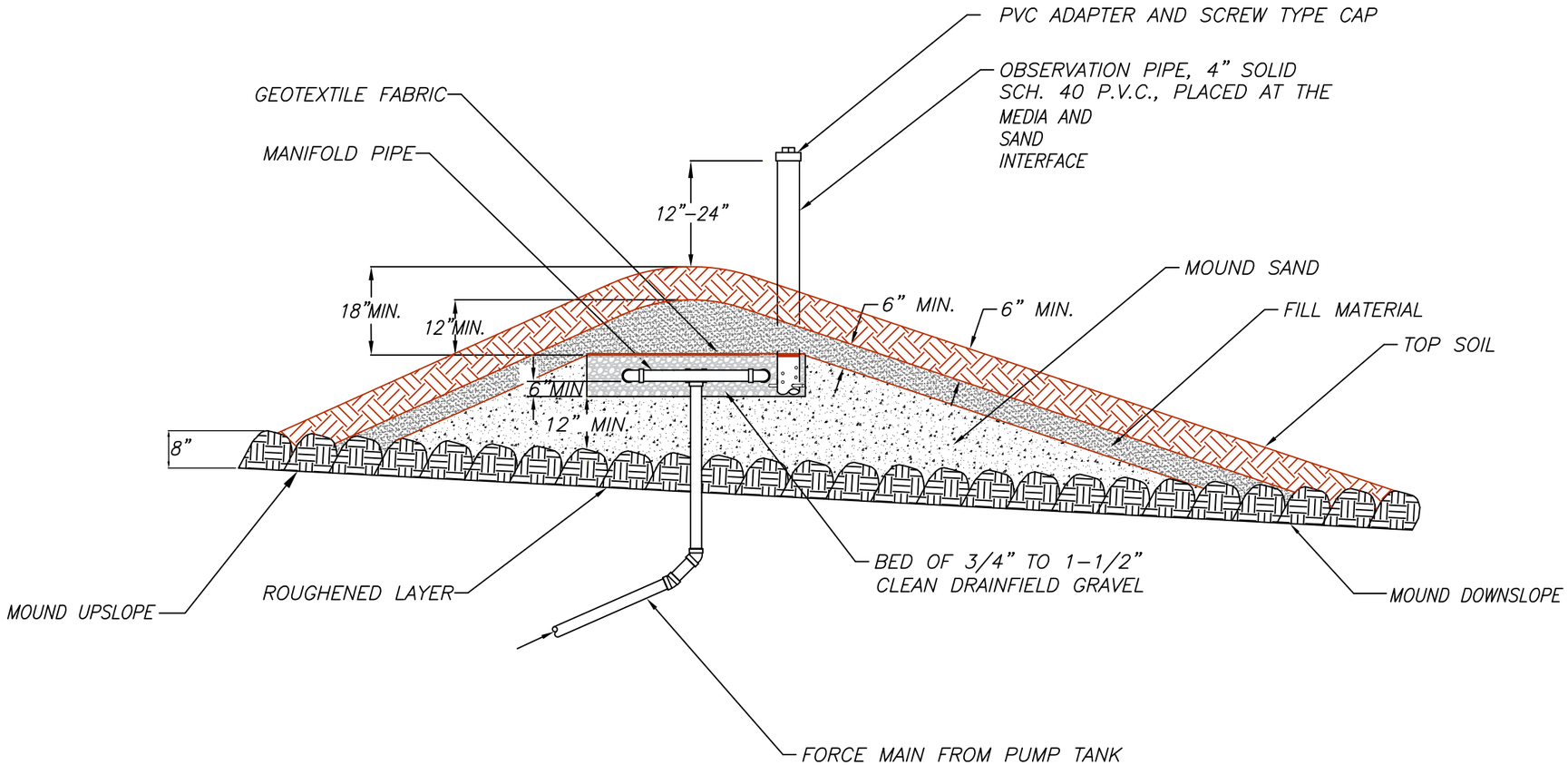
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
OFFICE OF ENVIRONMENTAL HEALTH
BEMIDJI AREA OFFICE BEMIDJI, MINNESOTA

TITLE:

# TYPICAL CONCRETE PUMP TANK

FOR SANITARY FACILITIES CONSTRUCTION
UNDER PUBLIC LAW 86-121

| DRAWN BY: R.A.M. | CHK'D BY: B.A.R. | DRAWING NO. 02541-D |
|---|---|---|
| REV. DATE: 02/10/16 | REV. DATE: 02/10/16 | 1 OF 4 |

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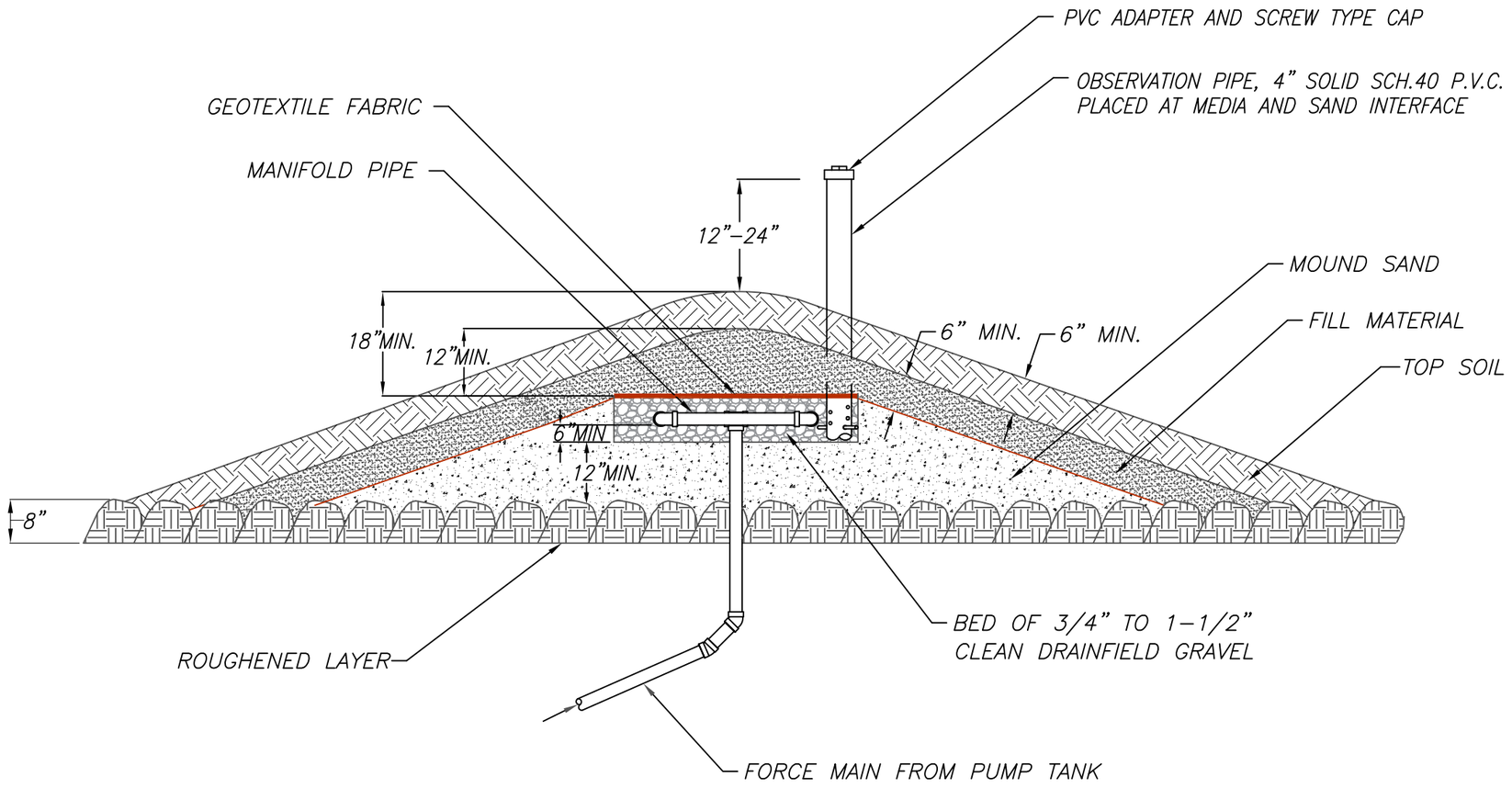
OFFICE OF ENVIRONMENTAL HEALTH
BEMIDJI AREA OFFICE BEMIDJI, MINNESOTA

TITLE:

# TYPICAL MOUND CROSS SECTION ON SLOPE>1%

FOR SANITARY FACILITIES CONSTRUCTION
UNDER PUBLIC LAW 86–121

| DRAWN BY: R.A.M. | CHK'D BY: B.A.R. | DRAWING NO. 02541-D |
|---|---|---|
| REV. DATE: 02/09/16 | REV. DATE: 02/09/16 | 2 OF 4 |

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PUBLIC HEALTH SERVICE
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BEMIDJI AREA OFFICE BEMIDJI, MINNESOTA

TITLE:

# TYPICAL MOUND CROSS SECTION ON SLOPE<1%

FOR SANITARY FACILITIES CONSTRUCTION
UNDER PUBLIC LAW 86–121

| DRAWN BY: R.A.M. | CHK'D BY: B.A.R. | DRAWING NO. 02541-D |
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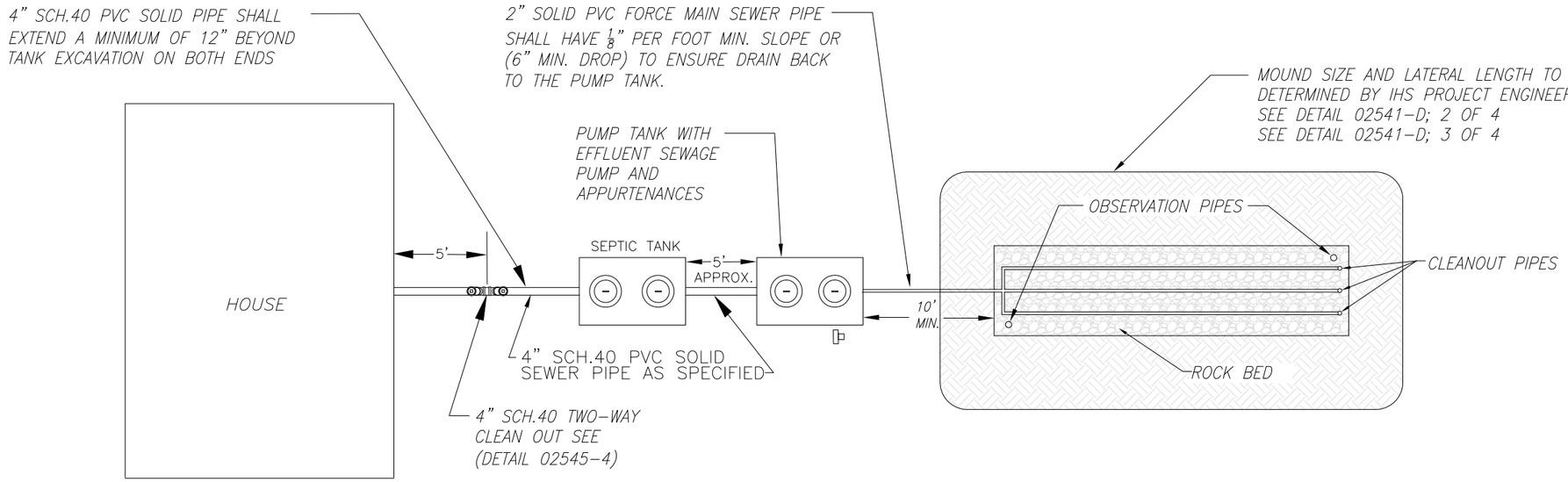
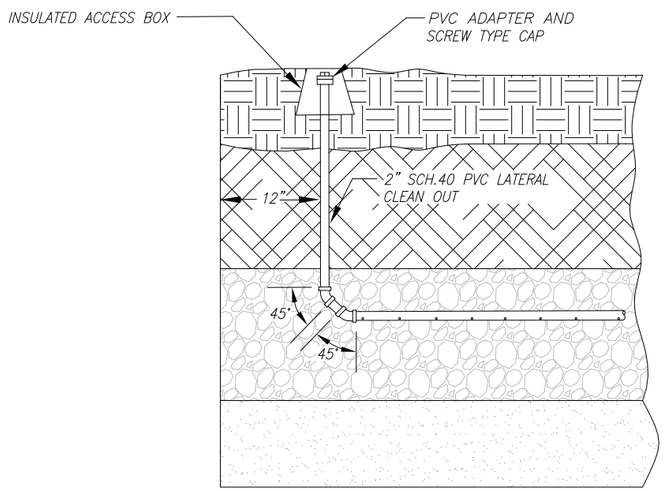
| REV. DATE: 02/09/16 | REV. DATE: 02/09/16 | 3 OF 4 |

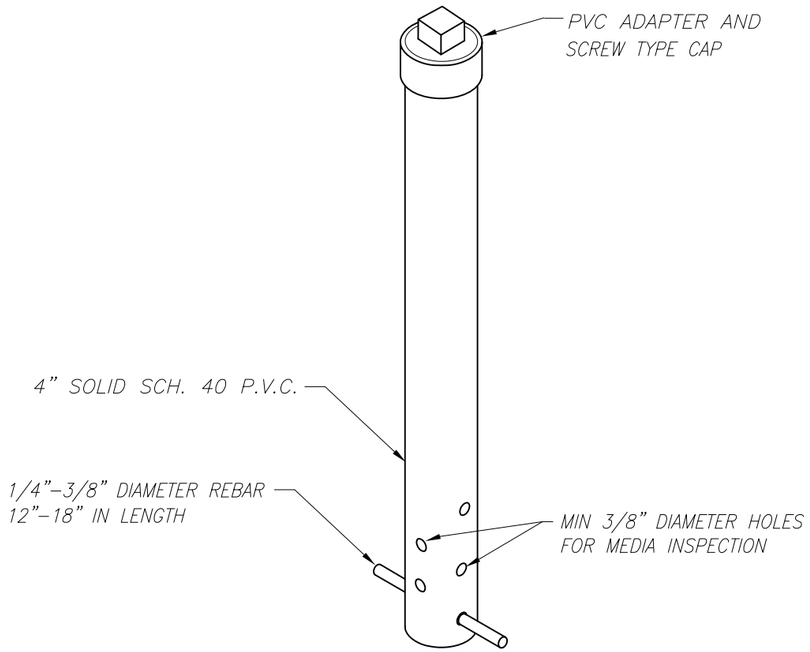



PLAN VIEW MOUND DETAIL
N.T.S.

NOTE:
*SEE ENGINEER DESIGN FOR TYPE OF MANIFOLD CONNECTION (END FEED IS SHOWN IN TYPICAL DRAWINGS)




LATERAL CLEAN OUT DETAIL
N.T.S.




OBSERVATION PIPE DETAIL
N.T.S.

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BEMIDJI AREA OFFICE BEMIDJI, MINNESOTA

TITLE:

# TYPICAL MOUND LAYOUT

FOR SANITARY FACILITIES CONSTRUCTION
UNDER PUBLIC LAW 86-121

| DRAWN BY: R.A.M. | CHK'D BY: B.A.R. | DRAWING NO. 02541-D |
|---|---|---|
| REV. DATE: 02/10/16 | REV. DATE: 02/10/16 | 4 OF 4 |

# SECTION 02545
# CONCRETE SEPTIC TANK AND PIPING

## PART 1 - GENERAL

1.01 SUMMARY

A. This section covers single and multi-compartment precast septic tanks. Also included is the piping from the home to the septic tanks, two-way cleanouts, and septic tank abandonment.

1.02 RELATED WORK (as applicable)

A. Section 01119 – Revisions to Standard Specifications
B. Section 01780 – Closeout Submittals
C. Section 02315 – Excavation, Trenching and Backfill
D. Section 02540 – Drainfields
E. Section 02541 – Pressure Dosed Mound Systems
F. Section 02542 – Pressure Dosed Trenches and Beds

1.03 REFERENCES

A. ASTM D 1785 – Polyvinyl Chloride (PVC) Plastic Pipe Schedule 40, 80 and 120.

B. ASTM D 3034 – Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings.

C. Minnesota Pollution Control Agency, Minnesota Rules Chapter 7080 – Subsurface Sewage Treatment Systems

1.04 SUBMITTALS

A. Septic tank
B. Septic tank riser and cover
C. Safety screen.
D. Effluent filter and alarm
E. Solid sewer pipe

1.05 QUALITY ASSURANCE

A. Septic tanks and other materials shall meet Minnesota Rules Chapter 7080 requirements if not otherwise specified in this Section.

## PART 2 - PRODUCTS

## 2.01 SEPTIC TANKS

A. Concrete tanks that meet Chapter 7080.

| | | |
|---|---|---|
| 1. | Minimum. reinforced concrete wall thickness | 2 inches |
| 2. | Minimum liquid depth | 2 1/2 feet |
| 3. | Maximum liquid depth | 5 1/2 feet |
| 4. | Concrete compressive strength | 3,000 psi |

B. Rectangular tanks shall have a minimum width of 36 inches and be constructed with the longest dimension parallel to the direction of flow.

C. Reinforce throughout with 6-inch x 6-inch – 10/10 wire mesh or fiber mesh.

D. Joints below the liquid level shall be of monolithic construction or have interlocking V-notch, shiplap or tongue and grove joints.

E. Inlet and Outlet

1. Connections: 4-inch Schedule 40 PVC, rubber boots.

2. Baffles: Open-end coated sanitary tees or other Chapter 7080 approved materials at the inlet and outlet. Extend at least 6 inches above and 9 inches below the liquid level.

3. The bottom of the outlet opening shall be at least 2 inches lower than the bottom of the inlet.

F. Manhole Risers and Covers

1. Provide at least two manhole openings no less than 24 inches in diameter with each single or multiple compartment tanks situated over the inlet pipe, baffle, outlet pipe, and effluent filter.

2. Manhole riser shall be cast in place polyethylene with gasketed connections or other approved water-tight material.

3. Covers shall be of the same material as the riser, with a warning label, printed with information regarding the hazards present when entering a septic tank affixed or supplied by the manufacturer.

G. Manhole Safety ScreenSafety screen shall be a Polylok 24 inch safety screen #3008-SS or approved equal.

1. Made of yellow ABS plastic with built in handle, to fit 24 inch Polylok manhole riser sections.

2. Unit to be rated and tested for 250 pounds per square foot.

3. Screen shall be installed, per manufacturer instructions, inside the top riser section that connects to cover dome facing up.

2.02 SOLID SEWER PIPE, CLEANOUT AND FITTINGS

A. Schedule 40 PVC fittings and caps shall conform to ASTM D 1785.

B. SDR 35 PVC pipe and fittings shall conform to ASTM D 3034.

C. Cleanout piping and cap shall be PVC and threaded.

2.03 EFFLUENT FILTER

A. Rated for 3,000 gpd flow rate.

B. Maximum filter opening: 1/16 inch.

C. Equal to Polylok PL-525 or Zabel A100 (12 x 20 inches).

2.04 PIPE HANGERS

A. Shall be made of a material compatible with piping material.

B. Shall be of sufficient strength to support the pipe at full capacity.

C. Shall not affect pipe integrity by either abrading, cutting or bending of pipe.

**PART 3 - EXECUTION**

3.01 SOLID SEWER PIPE and CLEANOUTS

A. Install solid sewer pipe from the house to the septic tank as indicated in design.

B. Solvent weld all joint connections.

C. Minimum cover over solid sewer pipe is 12-inches.

D. Minimum slope between the house and the septic tank is 1/8-inch per foot or 6 inches, whichever is greater.

E. There shall be no 90-degree bends in the pipe between the house and the septic tank.

F. Install two-way cleanout approximately 5 feet from the outside wall of home.

1. Cleanout shall allow rodding the sewer line both towards the home and towards the septic tank.

2. Fit cleanout with a threaded plug.

3. Install cleanout so the top is flush with the ground or as specified by the Engineer.

G. Insert inlet piping to be at least 6 inches but no more than 12-inches from baffle.

H. Inlet and outlet schedule 40 PVC pipe shall extend from the septic tank at least 12 inches past the tank excavation before transitioning if SDR 35 pipe is being used.

I. Properly seal pipe connections to tanks to prevent groundwater infiltration.

J. Install insulation in traveled areas as specified by the Engineer in accordance with Section 02315 – Excavation, Trenching and Backfill.

3.02 TANK INSTALLATION

A. Place tank in excavations at the locations and elevations designated on the plans or by the Engineer.

B. Refer to Section 02315 for excavation, backfill, and grading requirements.

C. Place tank level.

D. Install tanks in accordance with manufacturer’s recommendations.

E. Seal joints when the tank is set with an epoxy based sealing compound or Rub-R-Nek flexible gasket or equal.

F. Seal inlet and outlet with temporary plugs until connections are made to the inlet and outlet lines.

G. Set the top of the tank a minimum of 6-inches below finished grade. Do not exceed 24-inch cover depth unless tank is designed for deeper bury depth and Engineer approves.

1. Install tank lid insulation when tank lid is less than 24 inches deep with insulation with a minimum R-value of 10.

2. Install manhole risers and terminate access cover 3-6-inches above finished grade. Provide suitable locking screws or locking device that meets with Engineer's approval.

H. Do not drive over the tank during and after construction.

3.03 EFFLUENT FILTER

A. Center filter under the outlet manhole opening.

B. Solvent weld to 4-inch PVC Schedule 40 outlet pipe.

C. Install filter handle and extend handle to within 6-inches of the top of the access riser for easy access.

D. Conform to manufacturer's installation instructions.

3.04 EXISTING SEPTIC TANK ABANDONMENT

A. Abandon existing septic tanks where directed by the Engineer.

B. Pump tanks prior to abandonment, and dispose of contents in accordance with state and federal requirements.

C. Remove and dispose of any interior pipes, plumbing, or pumps.

E. Remove and dispose of concrete tank cover, risers, and inspection pipes.

F. Break or open bottom of tank.

E. Backfill interior of the tank with suitable, compactable soil material.

F. Conform to section 02310 – Grading, and section 02920 – Topsoiling, Seeding, Fertilizing and Mulching.

G. Locate abandoned septic tanks on the as-built drawing.

H. Other methods of abandonment are subject to prior approval by Engineer.

3.05 AS–BUILTS

A. Provide as-built information on each system in accordance with Section 01780.

**END OF SECTION**


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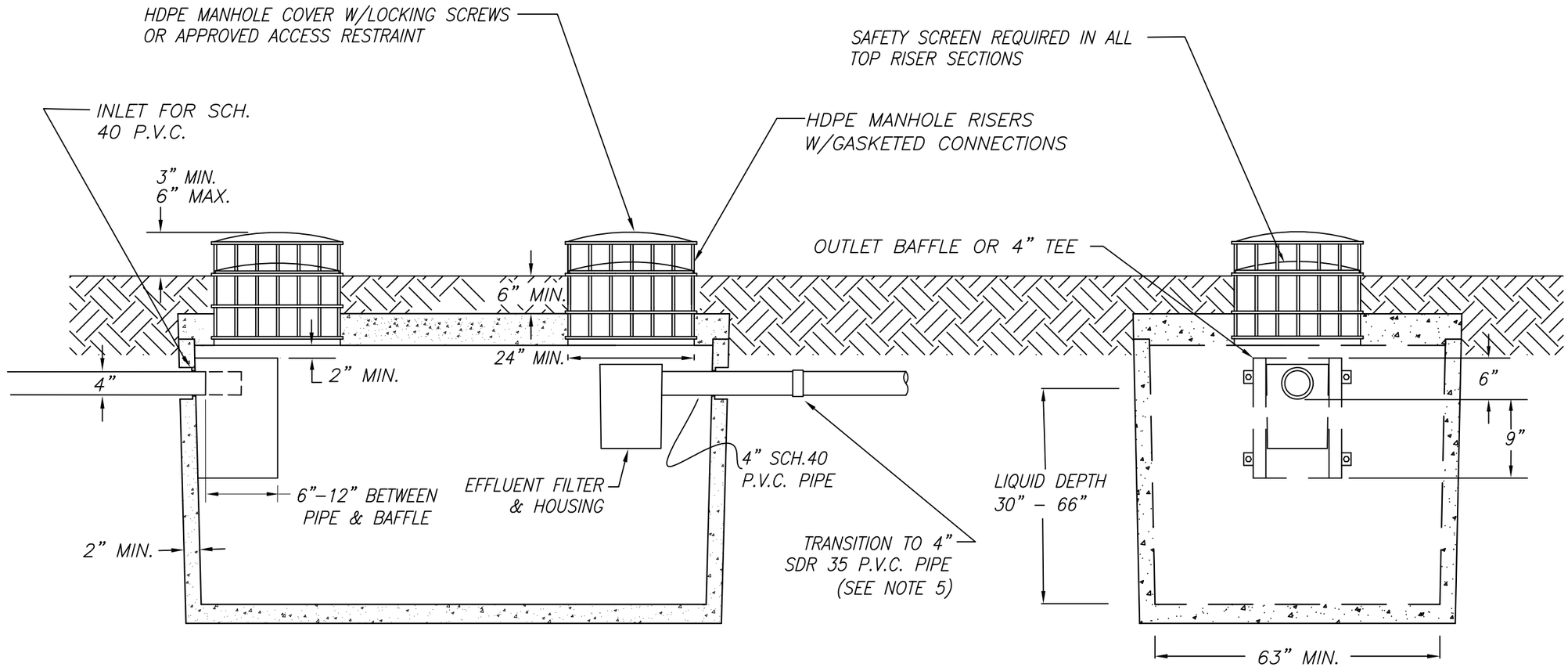


NOTE:

1. TANK TO BE REINFORCED THROUGHOUT WITH 6" X 6"–10/10 WIRE MESH OR FIBER MESH AS PER SPEC.
2. INLET BAFFLE OR TEE REQUIRED PER SPEC'S.
3. OUTLET IS 2"–3" BELOW INLET.
4. 1000 GALLON MINIMUM CAPACITY, OR AS SPECIFIED ON THE BID SCHEDULE.
5. SCH. 40 PVC PIPE SHALL EXTEND OUTWARD FROM THE SEPTIC TANK INLET AND OUTLET A MINIMUM OF 12–INCHES PAST THE EDGES OF THE TANK EXCAVATION.
6. INSTALL R10 VALUE INSULATION ON TANK LID IF LESS THAN 24" COVER

THIS DRAWING IS NOT TO SCALE

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PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
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BEMIDJI AREA OFFICE BEMIDJI, MINNESOTA

TITLE:

# TYPICAL DETAIL 1000 GAL. SEPTIC TANK

FOR SANITARY FACILITIES CONSTRUCTION
UNDER PUBLIC LAW 86–121

| DRAWN BY: R.A.M. | CHK'D BY: B.A.R. | DRAWING NO. 02545-D |
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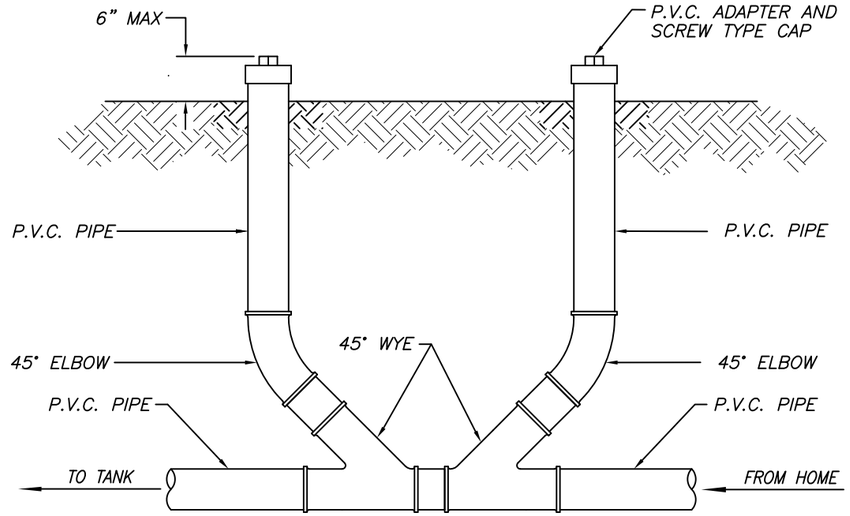
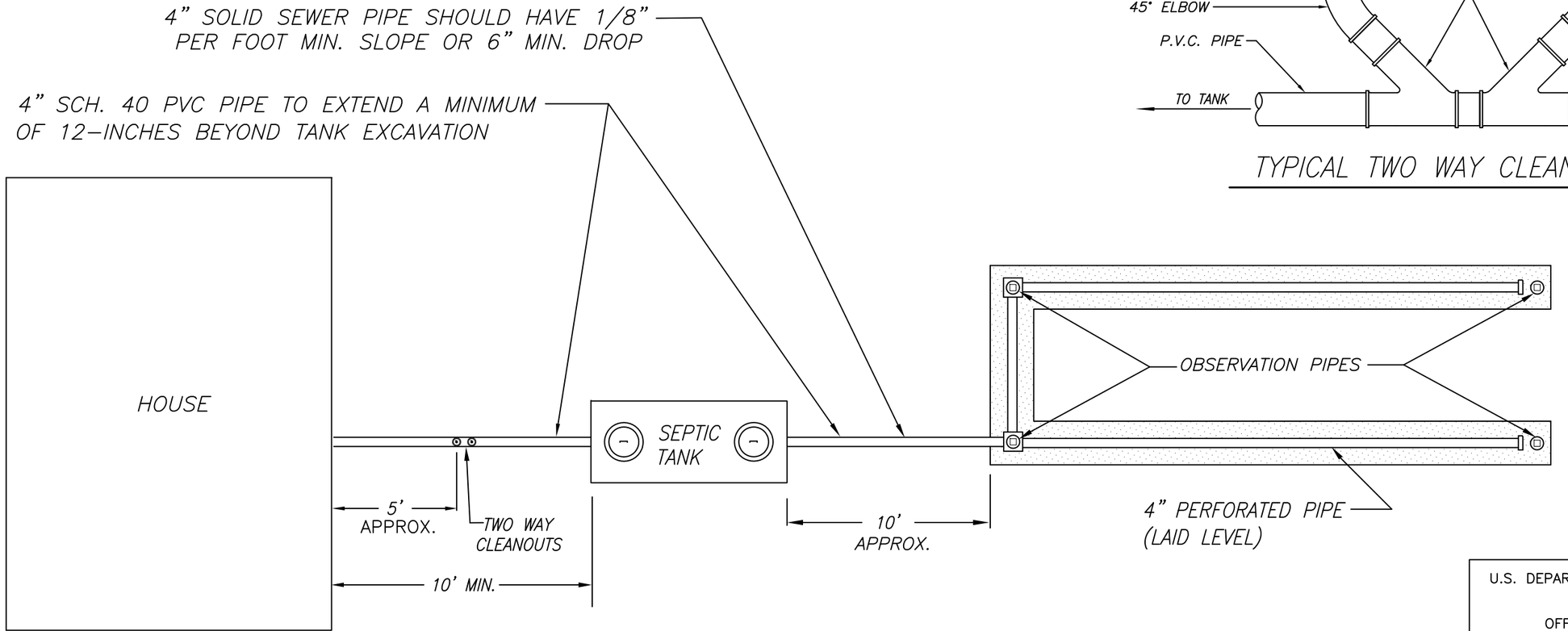
| REV. DATE: 02/16/16 | REV. DATE: 02/16/16 | 1 OF 2 |




TYPICAL TWO WAY CLEANOUT DETAIL




NOTE: DESIGN OF DRAINFIELD TO BE DETERMINED BY I.H.S. ENGINEER

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BEMIDJI AREA OFFICE BEMIDJI, MINNESOTA

TITLE:

# TYPICAL SEPTIC TANK LAYOUT

FOR SANITARY FACILITIES CONSTRUCTION
UNDER PUBLIC LAW 86-121

| DRAWN BY: R.A.M. | CHK'D BY: B.A.R. | DRAWING NO. 02545-D |
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| REV. DATE: 02/17/16 | REV. DATE: 02/17/16 | 2 OF 2 |

# SECTION 02920
# TOPSOILING, SEEDING, FERTILIZING, AND MULCHING

## PART 1 - GENERAL

1.01 SUMMARY

A. This section includes topsoiling, seeding, fertilizing, and mulching areas disturbed by construction activities.

1.02 RELATED WORK (as applicable)

A. Section 02310 – Grading
B. Section 02370 – Temporary Erosion and Sediment Control

1.03 REFERENCES

A. Minnesota Department of Transportation – Seeding Manual 2007 Edition.

1.04 SUBMITTALS

A. Topsoil
B. Seed Mixture and Application Rate Data
C. Mulching Material

## PART 2 - PRODUCTS

2.01 TOPSOIL

A. Natural loam, sandy loam, silt loam, silty clay loam, or clay loam humus-bearing soils adapted to the sustenance of plant life.

B. Neither excessively acid nor excessively alkaline.

2.02 FERTILIZER

A. Use a 20-10-10 mixture of 20% Nitrogen, 10% Phosphorous, and 10% Pot Ash.

2.03 SEED MIXTURE

A. Use Minnesota DOT seed mixture #240 or other Engineer accepted seed mixture for well drained sandy soils:

Minnesota DOT Seed Mixture #240

| | |
|---|---|
| 13% | Smooth Brome Grass |
| 27% | Kentucky Bluegrass |
| 13% | Canadian Bluegrass |
| 2.5% | Switch Grass |
| 4.0% | Slender Wheat-grass |
| 7.0% | “Reliant II” Hard Fescue |
| 20% | Perennial Rye-grass |
| 2.5% | Sand Dropseed |
| 3.5% | Little Bluestem |
| 7.0% | Red Clover |
| 0.5% | Purple Prairie Clover |

B. Use Minnesota DOT seed mixture #250 or other Engineer accepted seed mixture for average loam, heavy clay or predominately moist soils:

Minnesota DOT Seed Mixture #250

| | |
|---|---|
| 14% | Smooth Brome Grass |
| 29% | Kentucky Bluegrass |
| 14% | Canadian Bluegrass |
| 3.0% | Switch Grass |
| 21% | Perennial Rye-grass |
| 3.0% | Timothy |
| 3.0% | Redtop |
| 6.0% | Creeping Alfalfa |
| 3.0% | White Clover |

2.04 MULCHING MATERIAL

A. Straw or hay

**PART 3 - EXECUTION**

3.01 TOPSOIL

A. After grading is completed, spread stockpiled topsoil over all disturbed areas, excluding those where another type of finished surface is being provided.

3.02 FERTILIZING

A. Work soil to be seeded until soil is reasonably even and loose.

B. Fertilize all topsoiled areas using 20-10-10 fertilizer at an application rate of 400-600 pounds per acre.

3.03 SEEDING

A. Sow seed using either equipment suited to that purpose or scatter seed uniformly over area with hand seeders when the weather is sufficiently quiet to prevent seeds from blowing away. Use an appropriate method and rate as directed by the Mn/DOT Seeding Manual.

B. Lightly rake soil to cover the seed with approximately ¼ inch of soil.

3.04 MULCHING

A. Place hay or straw mulching on seeded area loose enough to allow some sunlight to penetrate and air to circulate but thick enough to shade the ground, conserve soil moisture, and prevent/reduce erosion.

B. Do not perform mulching activities during periods of excessively high winds, which would preclude the proper placing of the mulch.

C. Apply straw or hay uniformly over the disturbed area to a loose depth of ½ to 1½ inches using 1½ to 3 tons of mulch per acre.

D. Immediately after spreading, anchor mulch using a mulch tiller consisting of a series of dull flat discs with notched edges or other approved equipment.

E. Anchor mulch to a depth of approximately 1½ to 2½ inches in the soil.

3.05 QUALITY CONTROL

A. All work necessary for topsoiling, fertilizing, seeding and mulching shall be completed to insure adequate re-establishment of vegetation.

B. The Contractor is responsible for re-establishing vegetation.

**END OF SECTION**


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