

CONSTRUCTION PLAN

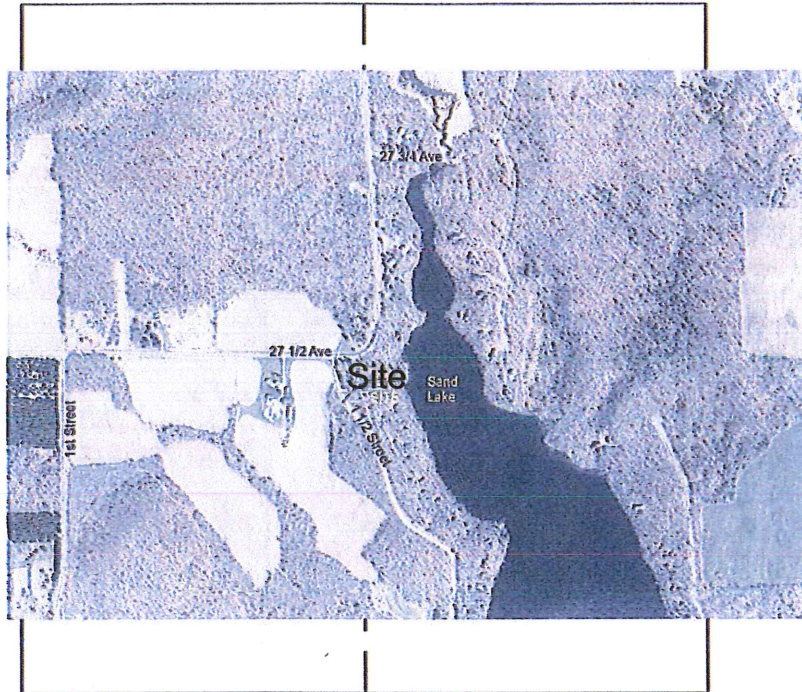
PRACTICE Underground Outlet 620 Class V Lined Waterway 468 Class II
 LANDOWNER Sand Lake District - Jerry Schliemann
 ADDRESS _____
 LANDOWNER PHONE NO. (763) 416-4529 COUNTY Barron
 TOWNSHIP Maple Plain T 36N N, R 11 E/W Sec. 17
 FIELD OFFICE Barron TELEPHONE NO. 715-537-6315

DIGGERS HOTLINE
 Call 3 Work Days
 Before You Dig!

Nationwide
 811
 Toll Free
 1-800-242-8511

TDD
 1-800-542-2289

Website
 www.diggershotline.com



LOCATION MAP

NOTICE TO LANDOWNERS AND EXCAVATORS

Any representation made by the USDA, Natural Resources Conservation Service, or the Barron County LCD, as to the approximate location or nonexistence of above or under ground hazards does not relieve the owner of the property or the excavator that is hired to complete construction, from notifying Diggers Hotline of the pending construction. You will be liable for damages resulting from construction activities. (Call Diggers Hotline) Ticket # _____

Designed by: W. J. [Signature] Date: 8/22/14
 Checked by: Dave Jorgenson Date: 8/22/14
 Approved by: Matt Blonowiak Date: 10/20/2014

The installed practices comply with applicable NRCS technical standards and specifications. The "redlined" construction plans (as-built drawings) reflect changes made during construction.

Construction Approved by: _____ Date: _____

Job Approval Class V

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY	SHEET NUMBER	WI. CONSTRUCTION SPEC. OR JOB SHEET NUMBER
Clearing and Excavation	Job	1		
12' Nylaplast Drop Structure	Each	1	5	
24" Corrugated PE N-12 WT pipe	Lin ft	360	5,6	WI. Construction Spec 15
24" Gaskets for cut pipe ends	Each	2	5	WI. Construction Spec 15
22.5 degree 24" N-12 WT Elbow	Each	1	4,6	WI. Construction Spec 15
11.25 degree 24" N-12 WT Elbow	Each	1	4,6	WI. Construction Spec 15
Angular Rock Rip rap D50 = 7"	Cu Yrd	174	7,8	WI. Construction Spec 9
Class I Geotextile	Sq Yrd	650	7,8	WI. Construction Spec 13
Sand Fill (surrounding pipe)4'x4'x530'	Cu Yrd	315		WI. Construction Spec 3
Topsoil	Cu Yrd	40		
Seeding	Ac	.25		
Erosion Control Blanket Class II	Sq Yrd	622		

Quantities are estimated to the neat lines and grades of in-place materials shown on the construction plan unless otherwise stated. Truck yardage, loose fill, shrinkage, etc., must be calculated and compensated for by the contractor preparing a bid or constructing the project.



ESTIMATED QUANTITIES

CLIENT: Sand Lake District
 COUNTY: Barron

Date

Designed WTG Aug 2014
 Drawn _____
 Checked DS
 Approved _____

Drawing Name
 WI-005

Date
 5/09

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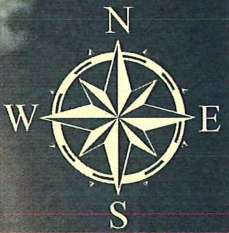
Sand Lake Gully Repair Project
Underground Outlet (620) and Lined Waterway (468)
Construction Notes

1. Utilities must be checked on both sides of the road. Call Diggers Hotline **1-800-242-8511**.
2. All items included in this plan must be installed according to NRCS Specifications attached to the end of the plan.
3. All debris and fallen trees shall be removed from the gully.
4. The culvert entrance on west side of the road shall have 3 steel safety bars installed to prevent entry.
5. To connect to the existing 24" under the road, cut pipe back a minimum of 3 corrugations to where there is no visual damage. On the new pipe the bell or spigot is cut off to achieve the same outside diameter as the existing pipe. Install a new gasket on both pipes and join the pipes using the coupler.
6. The 30" Nyloplast riser will be factory fabricated to include 24" inlet and 24" outlet. All Factory bells are 90 degree angles.
7. The riser area will be cleared for a stable foundation. The gasketed ends of the 24" N-12 WT pipe will be inserted into the Nyloplast riser.
8. The joint between the Nyloplast riser and the 24" N-12 WT outlet pipe will be covered with 1' of concrete in all directions.
9. The 24" HDPE pipe will be orientated along the center of the gully and run for 60' before a 22.5 degree elbow is installed. The first 3 sections will be installed at 2% deflection down from the previous pipes grade.
10. Subsequent pipes will be place at a 5.8% downslope grade. $5.8\% = 1.16'$ drop on each 20' section of pipe. The pipe will continue for 140' before an 11.25 degree elbow is installed. In addition, each joint will be deflected 1 degree (4" or .33') to the south in addition to the 5.8% down. The pipe will continue for another 140' after the 11.25 elbow with the same 1 degree deflection at each joint. A rodent guard to be installed at end of pipe. If additional deflection is needed, the pipe itself can also be deflected after anchoring the last joint. Do not exceed the 1 degree (4") deflection at each joint.

11. Clean sand fill with no rocks larger than 1", will be brought in and will be placed under the haunch of the pipe and hand compacted and then further fill brought in and compacted with manually directed equipment. Final fill depth will be approximately 4', covering the pipe with a minimum of 2' of fill. 6" of topsoil will be placed covering bottom and sides, seeded and covered with erosion control blankets. Staple blankets per manufacturers recommendations.

12. The pipe will outlet into a rock basin and then continue in a rock lined waterway to the lakeshore. All rock areas will be underlain with the Class I Geotextile.

Checked
DJ



Access Road

Outlet Protection
See Sheet 8

1 degree angle at each joint past the 22.5 degree elbow

Rock Lined Waterway
See Sheet 7

Sand
Lake

11.25 degree elbow

Planned 24" N-12 WT Pipe 350'

30" Diameter
Nylaplast Riser 12'

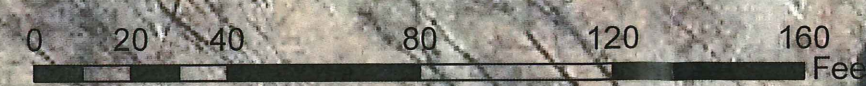
22.5 degree elbow

Existing 24" N-12 pipe

1267.25
Invert of Culvert
is the Benchmark

1 1/2 Street

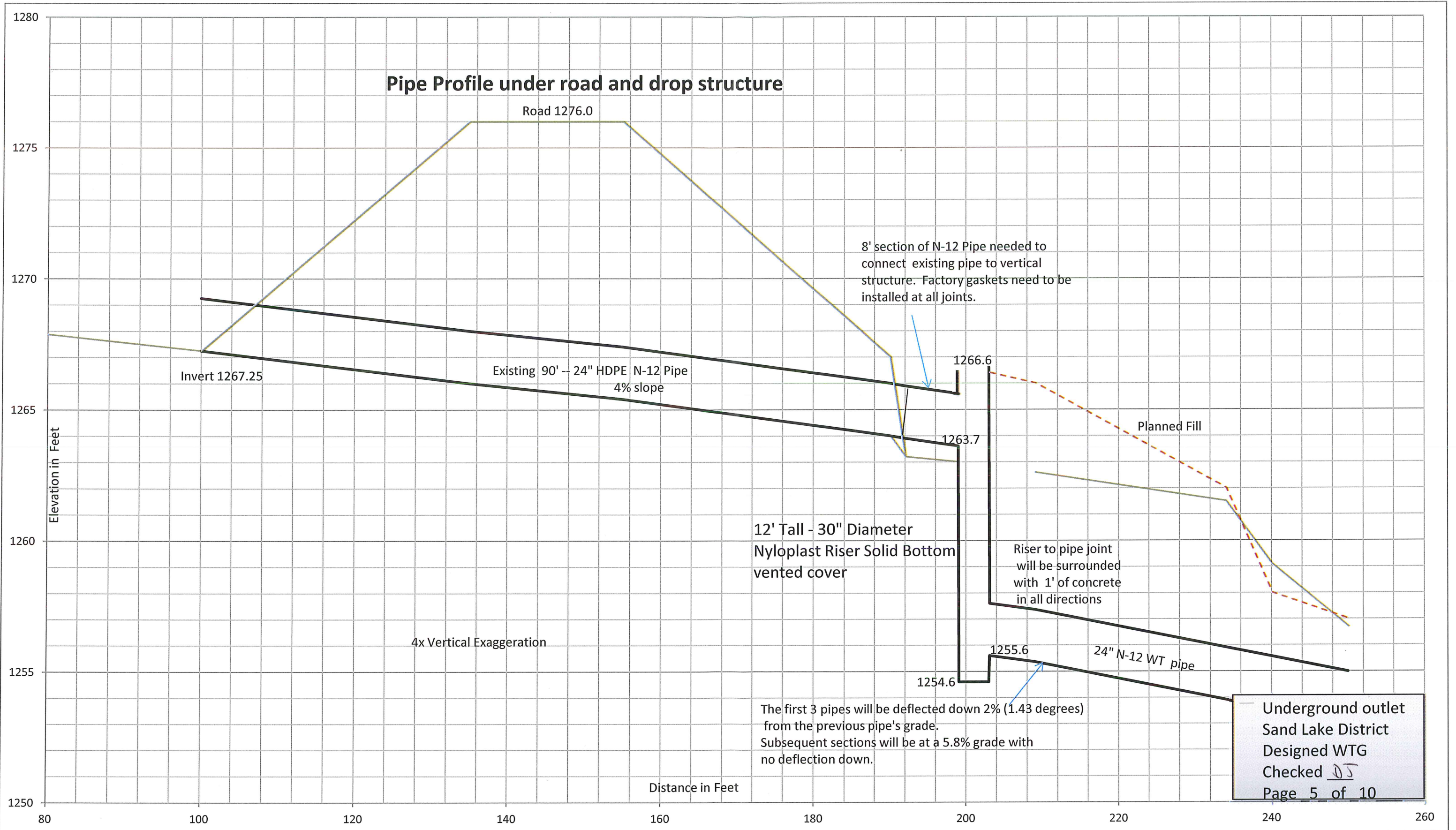
Scale 1" = 40'



10' Contour Intervals

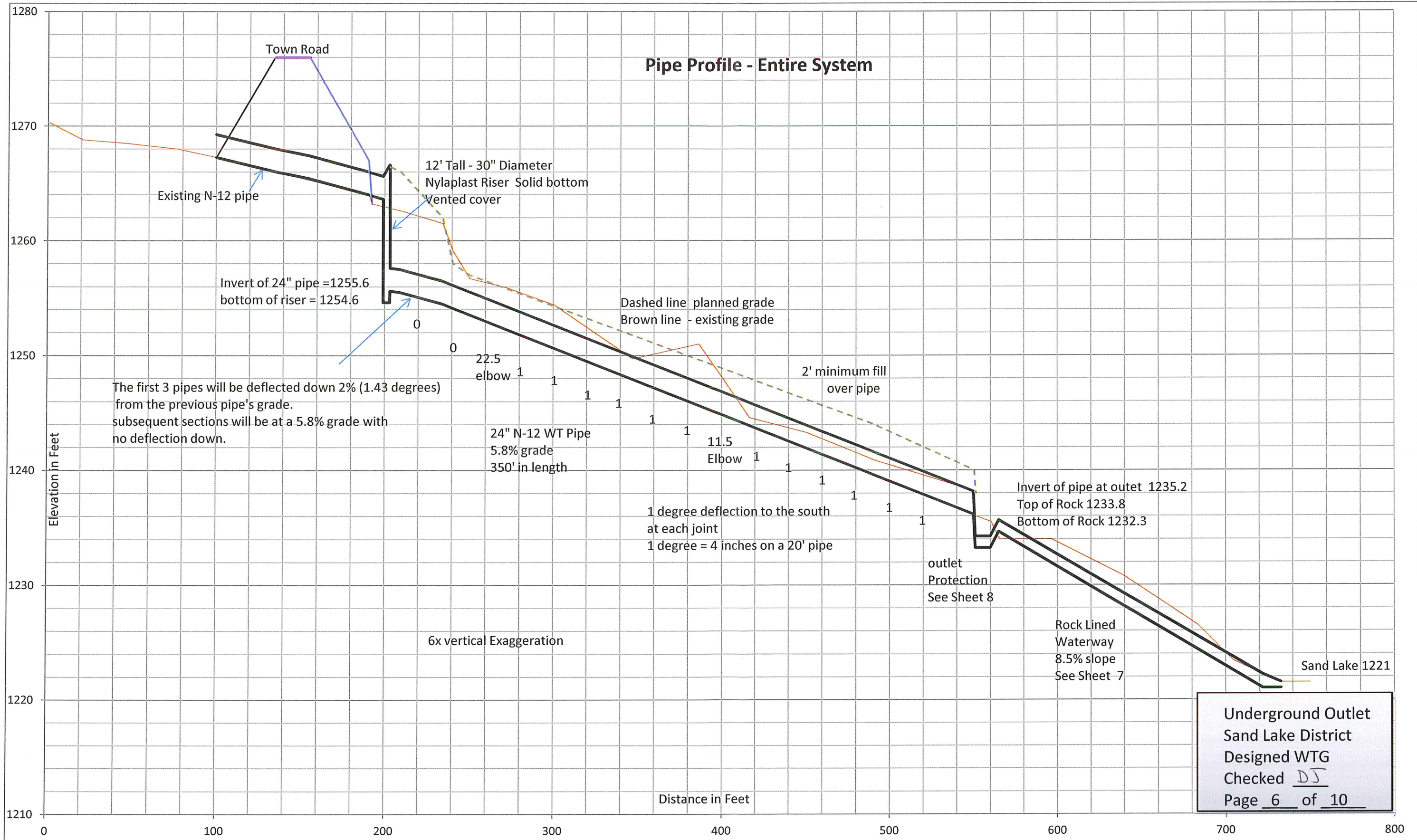
Sand Lake Gully Repair
Underground Outlet
Lined Waterway
Designed WTG
Checked DT
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Pipe Profile under road and drop structure



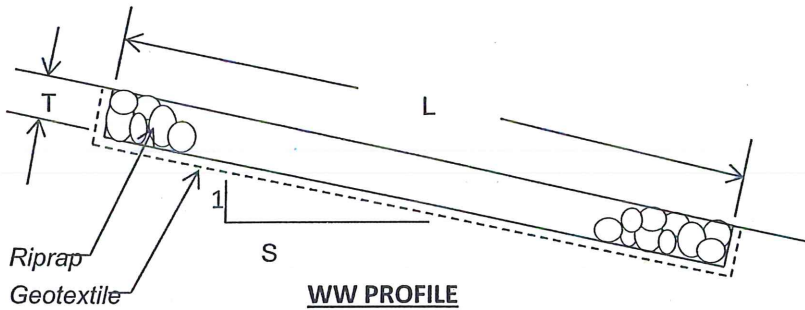
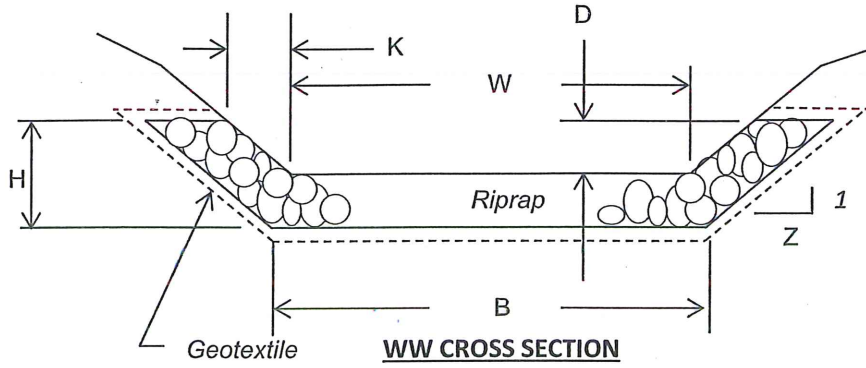
Underground outlet
 Sand Lake District
 Designed WTG
 Checked DJ
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Pipe Profile - Entire System



Underground Outlet
 Sand Lake District
 Designed WTG
 Checked DS
 Page 6 of 10

Trapezoidal Riprap-Lined Waterway Design.xlsm



CONSTRUCTION DETAILS

WATERWAY NUMBER	REACH		(W)	(B)	(H)	(D)	(Z)	(K)	(L)	(T)	(S)			
	FROM	TO												
1	5+50	7+30	6	6.5	2.5	1	3	3	180	1.5	12.0			
								-						
								-						

NOTES AND SPECIFICATIONS:

1. PLACE SPOIL WHERE IT WILL NOT INTERFERE WITH SURFACE WATER FLOW INTO THE WATERWAY

Angular Rock with a D50 of 7" see chart for gradation

2. **Class I Geotextile under all rock.**

Required riprap gradation for D50 selected				
% Smaller	Rock dia., inches		Rock weight, lb	
	min.	max.	min.	max.
100	10.5	14.0	84	200
85	9.1	12.6	55	146
50	7.0	10.5	25	84
10	5.6	9.1	13	55

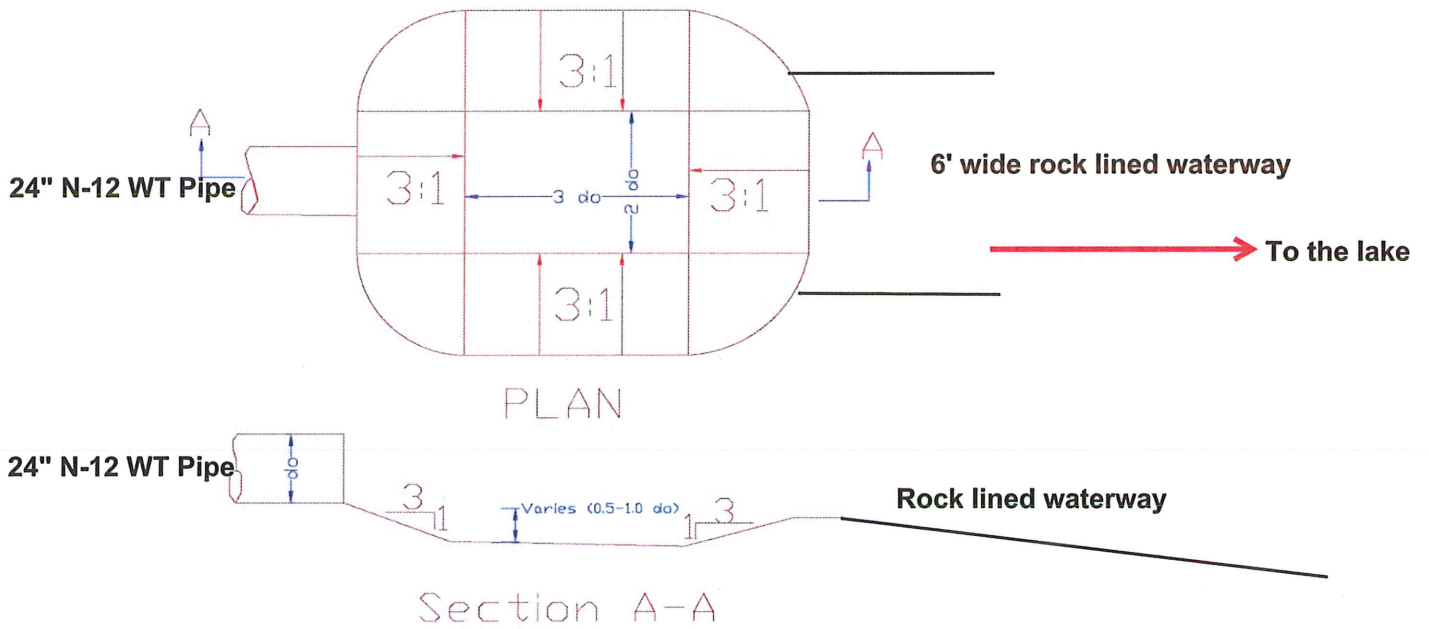


TRAPEZOIDAL Rock WATERWAY

CLIENT: Sand Lake Gully
 COUNTY: Barron

Date
 Designed: WTG 1/0/00
 Drawn: DJ
 Checked: 0 1/0/00
 Approved: _____

Preformed scour hole
(Figure 3-2)



Bottom Dimensions

6' long

4' wide

1.4' deep

D50 7" Angular rock - same as lined waterway

17' 1.5' Thick - same as lined waterway
underlain with geotextile - same as lined waterway

Invert of pipe 1235.5

Top of rock in basin 1234.1

SEEDING DATES

CENTRAL

TIME PERIOD	DATES			TYPE OF SEEDING
Spring	April 15	through	June 1	Permanent
Summer	June 2	through	see WI-710ss pg 2	Temporary *
Late Summer	August 1	through	August 21	Permanent
Fall	August 22	through	see WI-710ss pg 2	Temporary *
Late Fall	November 1	through	Snow Cover	Dormant
Winter	Snow Cover	through	April 14	Not Allowed

MATERIALS

If no soil test is available, apply a minimum of 150 pounds of 20-10-10 fertilizer per acre. This is equivalent to 30 pounds nitrogen (N), 15 pounds phosphate (P205), and 15 pounds potash (K2O) per acre. Apply two tons of 80-89 lime or equivalent.

* Seed a temporary cover crop of **Winter Cereal Rye** at 112 # /ac (2 bu/ac)
 A permanent seeding shall be completed during the next acceptable time period following a temporary seeding.

MINIMUM PURE LIVE SEED (PLS) ¹ RATE PER ACRE AND TOTAL POUNDS OF SEED NEEDED

SEEDING MIX (DESIGN)	6	LOCATION:	Gully
		ACRES:	0.25
SPECIES	RATE	POUNDS	
Smooth Bromegrass	10.5	2.6	
Timothy	3.0	0.8	
Creeping Red Fescue	1.5	0.4	
Kentucky Bluegrass	1.5	0.4	
Perennial Ryegrass	4.5	1.1	
Red Clover	4.5	1.1	
** Oats	96.0	24.0	

SEEDING MIX (AS-BUILT)	LOCATION ACRES	
SPECIES	RATE	POUNDS

¹ PLS = (% Germination x % Purity)

ADDITIONAL SEED PERCENTAGE: 50 %

** Companion Crop

Mulching Required Yes

Seed mixture shall meet all requirements of the WI weed laws.
 Species identified as restricted or prohibited by law shall not be planted.
 Certified seed shall be used, and the seeding rates will be based on pure live seed.
 For dormant seedings, increase the seeds per square foot by 15%.

SEEDBED PREPARATION

Seedbed preparation shall immediately follow construction activities.
 Prepare a fine, firm seedbed to a minimum depth of three inches. A seedbed is considered firm when a footprint penetrates 1/4 to 1/2 inch deep.

SEEDING

Inoculate legumes with the specific inoculum for the species in accordance with the manufacturer's recommendations. When using a hydroseeder, five times the recommended rate of inoculant shall be added to the hydroseeder. Inoculant shall not be mixed with liquid fertilizer.

Seed may be broadcast or drilled as appropriate to the site.
 Seed, fertilize, and lime as soon as possible after construction.
 Seeding perpendicular to direction of flow is required to limit erosion.



INTRODUCED SPECIES SEEDING ESTABLISHMENT

COOPERATOR Sand Lake District
 COUNTY Barron

	Designed	Date	File Name
Designed	WTG	8/22/14	WI-710SS
Drawn			pg 1 of 2
Checked	DJ		11-2013
Approved			Sheet 9 of 10 x

SEEDING CONTINUED

Seed grasses and legumes no more than 1/4 inch deep.

Consider seeding at a lower rate and making 2 passes to ensure more uniform distribution.

TEMPORARY SEEDING OPTIONS

Select one of the following species for temporary cover if:

- 1) The required seeds or plant stock are not available or the normal permanent seeding period for the species has passed
 - Forage Sorghum - 1/2 bushel per acre (May 15-July 15)
 - Sorghum - Sudangrass Hybrid - 1 bushel per acre (May 15-July 15)
 - Sudangrass - 1 bushel per acre (May 15-July 15)
 - Winter Wheat - 2 bushels per acre (Aug 1-Oct 1)
 - Winter Cereal Rye - 2 bushels per acre (Aug 1-Oct 15)
 - Oats - 2 bushels per acre (Apr 1-Sept 1)
 - Annual Ryegrass - 20 Pounds per acre (Apr 1-Sept 1)
- 2) Triazine herbicide carryover will not allow establishment of permanent cover immediately.
 - Forage Sorghum - 1/2 Bushel per acre (May 15-July 15)
 - Sorghum - Sudangrass Hybrid - 1 Bushel per acre (May 15-July 15)
 - Sudangrass - 1 Bushel per acre (May 15-July 15)

DORMANT SEEDING

Seed is broadcast and incorporated, no-tilled, or drilled into the seedbed . Seedbed preparations and conditions are similar to conventional seeding.

MULCHING

Mulching shall be done immediately after seedbed preparation and seeding.
 Mulch shall be applied immediately after final grading for areas seeded at a later date.
 Mulch material shall be relatively free of disease, pesticides, chemicals, noxious weed seeds, and other pests and pathogens.
 Spread straw and hay mulch uniformly and at the rate of 1.5-2.0 tons per acre (60-70 bales). This application results in a layer of 6 to 7 stems, 1 to 2 inches thick, and provides a minimum 70% ground cover. Some soil surface can be seen after the application. Crimping (disking), wood cellulose fiber, tackifiers, netting, pinning, or other acceptable methods of anchoring will be used if needed to hold the mulch in place.

If other mulch materials are used, the rate of application shall meet the manufacturer's recommendations

Cover with Erosion Control Blankets after seeding



INTRODUCED SPECIES SEEDING ESTABLISHMENT

COOPERATOR _____ Sand Lake District

COUNTY _____ Barron

Designed	WTG	Date	8/22/14
Drawn	_____		
Checked	DS		
Approved	_____		

File Name	WI-710SS
	Pg 2 of 2
	11-2013
Sheet	10 of 10

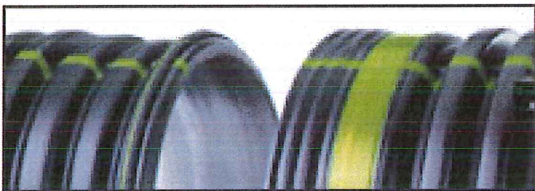
Sand Lake Gully Repair Project Underground outlet and Rock Lined Waterway

Construction Inspection Plan

Verify that the Utilities have been identified on both sides of the road. Obtain notes from Diggers Hotline.

Materials

Check the pipes. There are 18 - 20' sections of 24" HDPE N- 12 WT pipe. They are to have liquid tight joints which can be identified by a green band around the bell end of pipes. There is also an 11.25 and 22.5 degree elbow in the 24" size. Additional gaskets are for the extension of the existing pipe under the road.



There should be no visible damage to the pipes.
The Nylaplast riser assembly is 30" diameter and 12' tall.

Check the rock. It must be angular and free of soil and debris. The D50 size is 7". See chart for gradation.

Excavation and Clearing of Gully

All debris (mainly down trees) must be removed from the path of the pipe in the gully to allow for proper compaction of the pipe.

Pipe placement

Check the elevations and grades. They are noted on the plan view and profiles.

The grade for the outlet is 5.8%. Do not vary slope by more than+ .5%/

Check that bedding material has sufficient fines (12%+) and is free of rock.

Check that compaction is done around pipe and that it is not dislodged during compaction.

Outlet

Ensure that Class I Geotextile is placed below rock and that it extends upslope in all directions. Check that the installed rock is 1.5 thick.

Final Grading

Make sure that the fill that is brought in is compacted and free of debris and rock. Spread topsoil, seed, and install erosion control blankets. The blankets need to be stapled to manufacturers recommendation.

**Sand Lake Gully Repair Project
Underground Outlet and Lined Waterway**

Sand Lake District

Operation and Maintenance Plan

Periodic maintenance of the system is needed for the long term success of this project.

The culvert opening on the west side of the road has 3 steel bars in it to prevent entry. They need to remain in place and cleaned of any debris.

Check the grate on the east side of the road to make sure it is bolted on for safety.

If any areas in the gully erode, fill with soil and reseed.

The outlet has a rodent guard installed. Clean any debris that accumulates on it. Check that the rock has not been displaced by the flow and repair as needed. The outlet channel to the lake will need to be checked for erosion and repaired as needed.

If any problems or issues arise, call the Barron County Soil & Water Conservation Department at 715-537-6315.

_____ Date _____

_____ Date _____

Conservation Technician