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MICHAEL BERNS
OF COUNSEL

April 28, 2020

Mr. John Hall, Zoning Administrator
Champaign County Department of Planning & Zoning
Brookens Administration Center
1776 East Washington Street
Urbana, Illinois 61802

RE: HEATH POND SPECIAL USE EVALUATION
VACANT TRACT EASTERLY OF 485 COUNTY ROAD 2675 NORTH
NEWCOMB TOWNSHIP, CHAMPAIGN COUNTY, ILLINOIS

Dear **Mr. Hall**;

In accordance with your request to us and in keeping with our proposal for Engineering Services, dated February 7, 2020, we performed a limited review of the special use pond and storm water management analysis completed by Rex A. Bradfield. for the **Travis J. Heath** property at the vacant lot easterly of 485 County Road 2675 North, Newcomb Township, Champaign County, Illinois. As a part of our review we recently examined the following materials provided by the current petitioner:

1. General Engineering Report on Design, prepared by Rex A. Bradfield, dated January 27, 2020 (9 pages).
2. Grading; Drainage and Hydrology plan sheets, prepared by Rex A. Bradfield, dated January 27, 2020 (2 sheets).
3. General Engineering Report on Design, prepared by Rex A. Bradfield, dated March 11, 2020 (85 pages).
4. Grading; Drainage and Hydrology plan sheets, prepared by Rex A. Bradfield, revised March 11, 2020 (2 sheets).

Based upon our review of these materials we offer the following observations concerning the feasibility of the current drainage plan and proposed pond for this site:

Stormwater Drainage Calculations

1. With all criticisms aside, the ordinance requirements are the easiest with which to comply. Very rigorous, modern-day, hydrologic and hydraulic computation methods are available to engineers to more accurately characterize existing and proposed drainage conditions. However, the more accurate methods are considered to be too costly for small projects such as this.

   This project involves the construction of a pond, not a stormwater detention basin. Mr. Bradfield's criticisms of stormwater detention basin design criteria are interesting, but not relevant to the current situation. This project involves the construction of an 8-foot tall dam impounding approximately 3.6 acre-feet of water. As such it is subject to regulations issued by the State of Illinois Office of Water Resources. General Permit #98-1 authorizing certain class III dams appears to be applicable in this instance.

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To answer some of the ordinance criticisms included in the Bradfield reports we provide additional paragraphs explaining current trends in stormwater management, which may be included in future ordinances.

2. The chosen runoff coefficients (C=0.238 natural; C=0.273 pond) are reasonable for the project rational method calculations.

   For better accuracy in practice, the runoff coefficient is being replaced through the use of other methods. For instance, Horton infiltration and depression storage are being used more often to handle infiltration, initial-abstraction and losses. Computer models, such as SWMM, are being used to make this possible.

3. The provided ground slopes and corresponding time-of-concentration results in the Bradfield Report dated January 27, 2020 were incorrect and excessively long. It appears that corrections were made to the slopes and methodology in the Bradfield Report dated March 11, 2020. The corrected report appears to have acceptable time-of-concentration values which remain somewhat high. The provided Exhibit 2 has the largest time-of-concentration as 197 minutes which equates to a shallow concentrated flow velocity of approximately 0.21 feet/sec. As a check, this result equates to ground characterized as "forest with heavy ground litter; hay meadows" in Figure 15-4 of the NRCS National Engineering Handbook (NEH) upland method. This is probably an unreasonable assumption given current land conditions. However, use of this assumption does not make a significant difference in the overall design, so we suggest that this issue be overlooked.

4. The use of "pass through" flow for design is an assumption based on engineering judgement. However, state regulatory requirements of a minimum must be met. The current design appears to meet those state mandated minimums.

5. The SCS Type II, 6-hour storm which is utilized for the pond design is reasonable as the critical storm for design of this pond.

6. An overflow weir is an acceptable outlet. However, the calculations neglect the effect of rip rap along the weir. The calculations assume a flat weir surface. Rip rap has voids, which will allow flow through open spaces between individual rocks. The riprap thickness for the outlet weir is not shown. A 1-foot minimum thickness is required.

7. Assuming R-3 riprap placed along the proposed 30-foot weir width between elevations 708 and 709 feet, peak flows through rip rap would appear to be restricted to meet existing 1-year, 2-year and 5-year return period storm events minimum values. An estimate of high flow through the voids in riprap of this scenario could be as much as 15 cubic-feet-per-second (cfs). Rip rap flow-thru analysis is available through the FHWA Hydraulic Toolbox.

8. No bypass route is shown on the plans for Sub-basin 1. Will the bypass water velocity cause scour? Flow spreaders or flow dissipaters may be used to disperse any new concentrated flows. If Sub-basin 1 is to be tributary to the proposed pond, the pond storage excess may need to be increased.

Plan Sheet Comments

9. The pond plan has the ratio of watershed area to pond area of 56 acres to 4 acres (14:1) which is in the ideal range of ratios (10:1 to 20:1) to prevent turbidity from siltation as well as sedimentation. This part of the design is appropriate.

10. No geosynthetic material or bedding material is called out for protection of the underlying base material of the proposed riprap areas. Such materials are essential under these types of flow conditions.

11. Earth embankment materials and compaction requirements must be specified for the dam. The removal of existing topsoil should be specified for the dam location. A detail and specification for a core / cutoff trench to prevent seepage must be included. All of these requirements are essential to the successful construction of the dam.

12. A 6-inch diameter drain pipe with anti-seep collars and valve is recommended to allow for completely draining the pond in fish / pond maintenance instances. A drain pipe is shown on the Plans, but the size is not indicated. An anti-seep collar must be provided for the pipe. The design indicates there is to be a lock gate provided. The type of valve is not indicated, and needs to be added.

13. Temporary erosion controls are not clearly indicated on the plans, and erosion control detail drawings are missing. This information should be added.

14. A permanent Portland Cement concrete weir needs to be installed as the outlet control for the pond outflow over the dam. A detail is needed.

State Regulations

15. The State regulations require that the top of the dam be provided with a freeboard of 18 inches above the 100 year storm pond water surface elevation. We estimated the water surface elevation as 709.0 feet ± during the 100 year storm event. At a minimum the top elevation of the dam must be raised to 710.5 feet to comply with this regulation.

16. The state regulations require that the minimum top width of the dam be 10.0 feet. It is currently designed as 5 feet in width, which does not comply. The design must be altered to comply with this requirement

17. The State regulations require that a geotechnical analysis be performed to confirm that any fill placed within the dam has been properly compacted and utilizes suitable materials. The construction specifications must be amended to include this requirement.

18. The spillway flow capacity appears to meet the requirements of the state regulations.

19. The state regulations require that the upstream face of the dam be protected from wave erosion from 2 feet below the normal pool elevation to 2 feet above. This erosion protection must be added to the dam and shown on the design documents. Grass erosion protection is not considered adequate by the State regulations.

20. The State regulations require that the primary spillway be designed of materials that will not erode. Trickle flow from the pond will occur along the bottom of the proposed riprap, causing soil erosion. The current design does not meet minimum state regulations. This deficiency can be corrected by installing a 5-feet wide – 12-inches deep Portland Cement concrete shelf or weir along the bottom of the spillway, and extending at least 5 feet outward from outer ends of the spillway. (see Comment 14)

21. The State regulations require that the dam design include a cutoff trench to tie the proposed dam to the existing soil surface. All existing topsoil under the dam must be removed. A core trench at least 8-feet wide and 6-feet deep must be installed. The plans must be modified to include these requirements.

In conclusion, the March 11, 2020 plans and report of Rex Bradfield provide an inadequate preliminary design. In our opinion, the current pond report and plans should not be approved unless multiple revisions are made to bring the design into compliance with County requirements and State regulations.

Given the long delay in review and approval of this Special Use Permit application brought on by the COVID-19 pandemic we felt it might be prudent to try to expedite the review / approval of the application by providing some standard details published by the Natural Resources Conservation Service that would be applicable to this project and can be included in the "approved" set of Construction Plans. Use of these materials may help you conclude the review process more quickly, without the applicant facing another round of revisions to the Plans.

We appreciate this opportunity to be of assistance to you. If you have any questions, please call. **Thank you.**

Sincerely,
BERNS, CLANCY AND ASSOCIATES, P.C.

Donald S. Wauthier, Vice President

Items needed for approval:

- Earth embankment materials and compaction requirements must be specified.
- A detail and specification for a core / cutoff trench to prevent seepage beneath the dam must be included.
- Provide specific temporary erosion control measures with locations shown on the plans.
- Designate permanent erosion protection of the diverted flow path of Sub-basin 1 around the pond.
- Install a concrete weir to prevent overflow down cutting of the spillway.
- Provide a riprap design detail drawing showing riprap thickness, bedding / filter fabric and stabilization. Stabilization of riprap is key because of the pass-through low flow.
- Spillway riprap must be RR-3 or larger, a minimum of 1.0 feet thickness. Not less than 6-inch thickness of CA-6 or CA-10 should be placed as bedding for the spillway riprap. Geotextile fabric should be placed below the bedding.
- The size of the drain pipe must be indicated. The type and location of the valve must be indicated.
- The drain pipe must be provided with a proper anti-seep collar.
- The top elevation of the dam must be raised to 710.5 feet minimum, after allowance for settlement.
- The top width of the dam must be 10.0 feet minimum.
- Specifications requiring creation of a proper foundation for the dam must be provided.
- A detail and specifications must be provided for installation of erosion protection for the face of the dam.

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Heath Pond Special Use
Newcomb Township, Champaign County, Illinois

February 10, 2020

Flow Summary

Discharge Comparison

Proposed Discharge Rates

100-year proposed discharge	38 cfs
50-year proposed discharge	22 cfs
25-year proposed discharge	12 cfs
10-year proposed discharge	9 cfs
5-year proposed discharge	7.5 cfs
2-year proposed discharge	6 cfs
1-year proposed discharge	4 cfs

Existing Discharge Rates

100-year existing discharge	52 cfs
50-year existing discharge	44 cfs
25-year existing discharge	35 cfs
10-year existing discharge	27 cfs
5-year existing discharge	23 cfs
2-year existing discharge	19 cfs
1-year existing discharge	15.5 cfs

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DESIGN REVIEW

CALCULATIONS

AND ANALYSES

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Heath Pond Special Use
Newcomb Township, Champaign County, Illinois

February 10, 2020

Rainfall Intensity - Illinois East

	Return Period						
Duration (Minutes)	**1 year Inch/Hour**	**2 year Inch/Hour**	**5 year Inch/Hour**	**10 year Inch/Hour**	**25 year Inch/Hour**	**50 year Inch/Hour**	**100 year Inch/Hour**
1440	0.10	0.13	0.15	0.18	0.21	0.24	0.28
1080	0.13	0.15	0.19	0.22	0.26	0.30	0.34
720	0.18	0.22	0.27	0.31	0.37	0.42	0.48
360	0.31	0.38	0.46	0.53	0.63	0.73	0.83
180	0.53	0.64	0.79	0.91	1.07	1.25	1.41
120	0.73	0.89	1.09	1.26	1.49	1.72	1.95
60	1.16	1.41	1.74	2.00	2.39	2.74	3.11
30	1.82	2.22	2.74	3.14	3.74	4.32	4.90
15	2.68	3.24	4.00	4.56	5.48	6.40	7.40
10	3.24	3.96	4.86	5.64	6.72	7.68	8.76
5	3.60	4.32	5.28	6.12	7.32	8.40	9.48

* Derived from Bulletin 70, Appendix A: pg 107-122, dated 1989

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Heath Pond Special Use
Newcomb Township, Champaign County, Illinois

February 10, 2020

Summary of Formulas

Surface Flow (Rational Method)

Sheet Flow		kinematic solution to Manning's equation $T_i=0.007*(n*L)^{\wedge}0.8/(P_2{}^{\wedge 0.5}*S^{\wedge 0.4})*60$ T_i=Initial Time n=Roughness Coefficient for Overland and Sheet Flow L=length of flow path P_2=2 year/24 hour rainfall S=slope
Shallow Flow		Tt=L/V T_t=Travel Time L=length of flow path $V=\text{velocity}=k*V_c*S^{\wedge 0.5}$ k=dimensionless function of land cover V_c=unit conversion constant (33 in CU units 10 in SI units) S=slope
Time of Concentration		$T_c=T_{i1}+T_{t2}+T_{t3}+T_{t4}$
Rainfall Runoff		R=K*c*I*A
	K factor	Adjustment factor for larger rainfall events =1.0 for 2 year, 5 year and 10 year events =1.1 for 25 year event =1.2 for 50 year event =1.25 for 100 year event
	c factor	weighted average rainfall runoff factor =(see Typical Runoff Drainage Coefficients list)
	I	rainfall intensity at time T_c
	A	Area of water shed
Orifice Flow		$O=C*A*(2*g*H)^{\wedge 0.5}$ C=orifice constant = 0.6 A=area of orifice G=gravity constant = 32.2 H=height of surface above centroid of orifice
Weir Flow		$W=C*L*H^{\wedge 1.5}$ C=weir constant = 3.0 L=weir length (perimeter) H=height of flow over weir
Detention Basin Volume		Q=max((R-O)*T) T=time

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Heath Pond Special Use
Newcomb Township, Champaign County, Illinois

February 10, 2020

Typical Runoff Drainage Coefficients

Description	Coefficient (c factor)
Impervious Area	0.98
Roof	0.95
Pavement	0.95
Compacted Stone	0.80
Bare Earth	0.65
Suburban Residential	0.55
Grass Lawn	0.20
Pervious Area	0.10

Intercept Coefficients for Velocity vs. Slope Relationship (McCuen, 1989)

k	Land Cover / Flow Regime
0.076	Forest with heavy ground litter; hay meadow (overland flow)
0.152	Trash fallow or minimum tillage cultivation; contour or strip cropped; woodland (overland flow)
0.213	Short grass pasture (overland flow)
0.274	Cultivated straight row (overland flow)
0.305	Nearly bare and untilled (overland flow)
0.457	Grassed waterway (shallow concentrated flow)
0.491	Unpaved (shallow concentrated flow)
0.619	Paved area (shallow concentrated flow)

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Heath Pond Special Use
Newcomb Township, Champaign County, Illinois

February 10, 2020

Time of Concentration - Runoff - Existing Conditions

Initial Time for Sheet Flow

L	100	feet
n	0.24	grass
P2	3.01	
s	1.20%	
Ti	18.05	Minutes

Travel Time for Overland / Shallow Concentrated Flow

L	1806	feet
s	1.20%	
factor	0.2130	short grassed pasture
V	0.77	fps
Tt	39.09	minutes

L	537	feet
s	1.20%	
factor	0.4570	grassed waterway
V	1.65	FPS
Tt	5.4	Minutes

Time of Concentration

Tc	62.6	minutes

Existing Conditions Peak Runoff

Area		c	
56.5	acres±	0.24	Weighted
	acres±		
56.5	acres	0.24	

Event	Intensity		K factor	Peak Runoff	
1	1.14	in/hr	1	15.48	cfs
2	1.39	in/hr	1	18.82	cfs
5	1.71	in/hr	1	23.22	cfs
10	1.97	in/hr	1	26.69	cfs
25	2.35	in/hr	1.1	35.08	cfs
50	2.70	in/hr	1.2	43.88	cfs
100	3.06	in/hr	1.25	51.88	cfs

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Heath Pond Special Use
Newcomb Township, Champaign County, Illinois

February 10, 2020

Time of Concentration - Runoff - Post Development

Initial Time for Sheet Flow

L	100	feet
n	0.24	grass
P2	3.01	
s	1.20%	
Ti	18.05	minutes

Travel Time for Overland / Shallow Concentrated Flow

L	1806	feet
s	1.20%	
factor	0.2130	short grassed pasture
V	0.77	fps
Tt	39.09	minutes

Time of Concentration

Tc	57.1	minutes

Proposed Post Development Peak Runoff

Area		c	
56.5	acres±	0.24	Weighted

	56.5	acres	0.24		
Event	**Intensity**		**K factor**	**Peak Runoff**	
1	1.22	in/hr	1	16.58	cfs
2	1.49	in/hr	1	20.17	cfs
5	1.84	in/hr	1	24.89	cfs
10	2.11	in/hr	1	28.59	cfs
25	2.52	in/hr	1.1	37.57	cfs
50	2.89	in/hr	1.2	47.04	cfs
100	3.28	in/hr	1.25	55.61	cfs

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Figure 15–4 Velocity versus slope for shallow concentrated flow

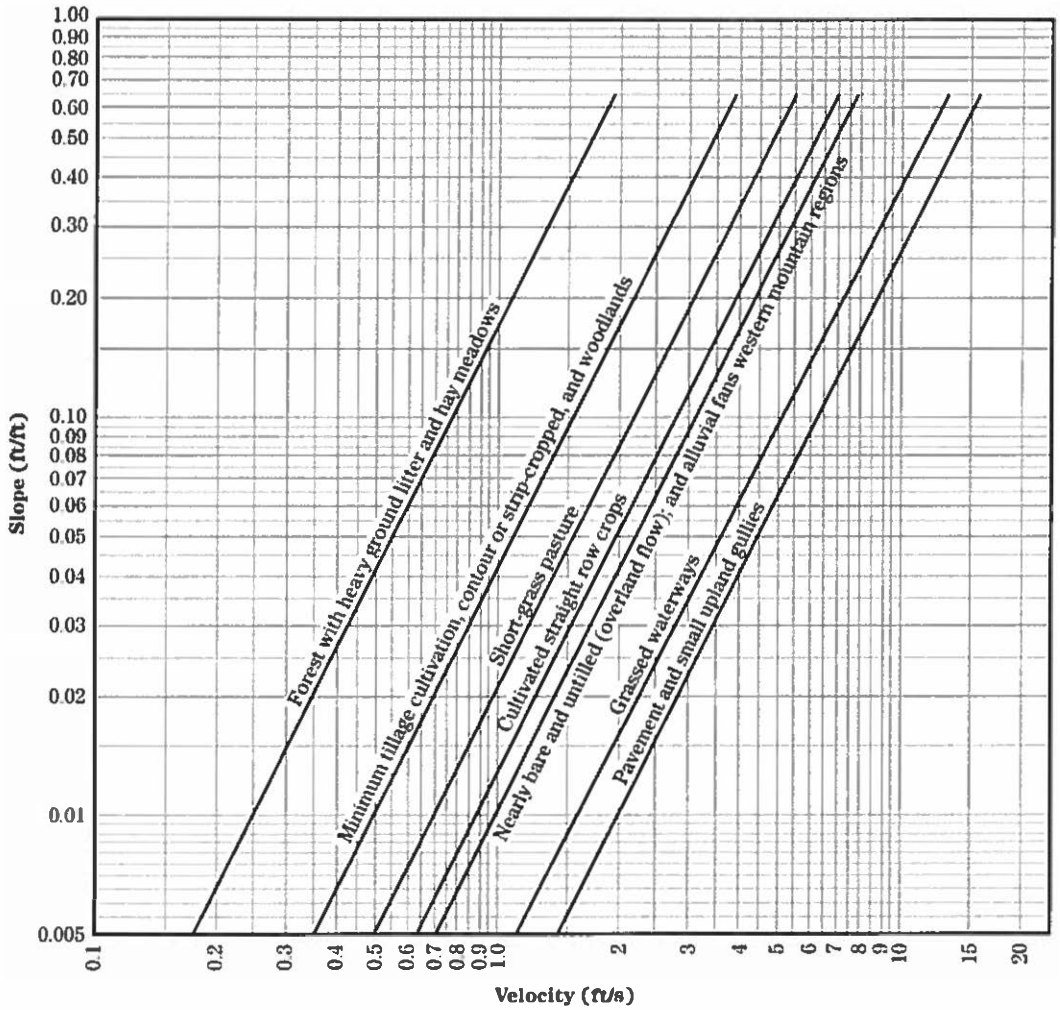


Table 15–3 Equations and assumptions developed from figure 15–4

Flow type	Depth (ft)	Manning's *n*	Velocity equation (ft/s)
Pavement and small upland gullies	0.2	0.025	$V = 20.328(s)^{0.5}$
Grassed waterways	0.4	0.050	$V=16.135(s)^{0.5}$
Nearly bare and untilled (overland flow); and alluvial fans in western mountain regions	0.2	0.051	$V=9.965(s)^{0.5}$
Cultivated straight row crops	0.2	0.058	$V=8.762(s)^{0.5}$
Short-grass pasture	0.2	0.073	$V=6.962(s)^{0.5}$
Minimum tillage cultivation, contour or strip-cropped, and woodlands	0.2	0.101	$V=5.032(s)^{0.5}$
Forest with heavy ground litter and hay meadows	0.2	0.202	$V=2.516(s)^{0.5}$

2300-61

Heath Pond Special Use
Newcomb Township, Champaign County, Illinois
Stage - Storage - Discharge Calculations

Weir Calculation

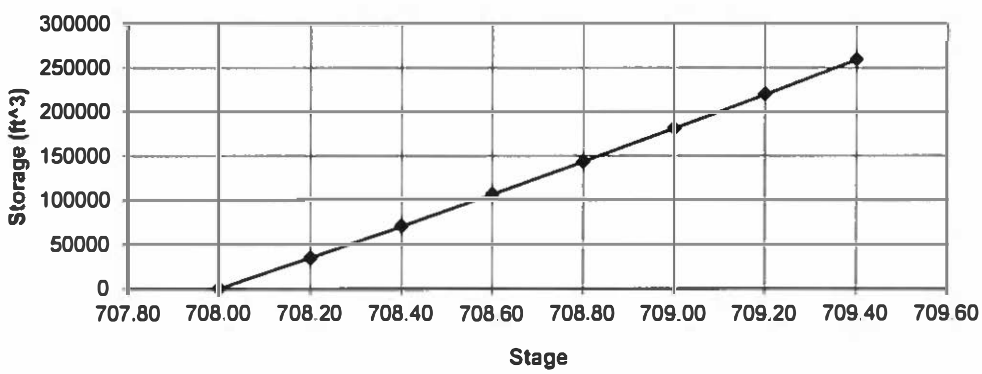
Weir Coefficient	3.367
Bottom Width (ft)	30.00
Bottom Elevation (ft)	708.00
Top Elevation (ft)	710.00

Q = C*L*h^3/2
multiply by void ratio
for flow estimate
through riprap

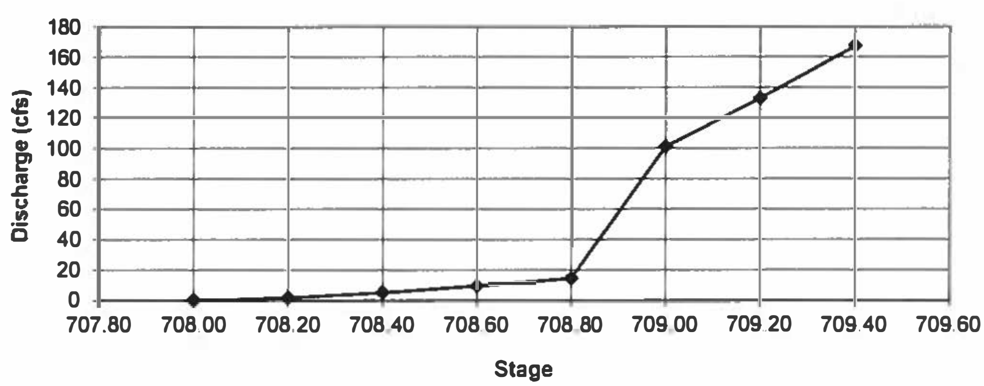
Stage - Storage - Discharge

Void Ratio	Elevation (ft)	Area (ft^2)	Storage (ft^3)	Peak Discharge (cfs)	Avg Flow (cfs)
	708.00	173077	0	0	0
0.2	708.2	176386	34946.3	1.81	0.64
0.2	708.4	179695	70554.4	5.11	1.81
0.2	708.6	183003	106824.2	9.39	3.32
0.2	708.8	186312	143755.7	14.46	5.11
1	709	189621	181349.0	101.01	35.71
1	709.2	194767	219787.8	132.78	46.95
1	709.4	199914	259255.9	167.32	59.16
1	709.6	205060	299753.3	204.43	72.28

Stage - Storage



Stage - Discharge



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Hydraulic Analysis Report

Project Data

Project Title: 2300-61

Designer:

Project Date: Wednesday, February 12, 2020

Project Units: U.S. Customary Units

Notes:

Riprap Analysis: Riprap Analysis

Notes:

Input Parameters

Riprap Type: Embankment Overtopping

Calculations will use either total or overbank discharges.

Total Discharge: 50 cfs

Embankment Slope: 4:1 (H:V)

Embankment Overtopping Length: 38 ft

Weir Flow Coefficient: 3.367

Riprap Sizing Equation Coefficient: 0.525 s^0.52/ft^0.04

Coefficient of Uniformity of the Riprap: 2.1

Coefficient of Uniformity = D60/D10

Porosity: 0.45

Angle of Repose: 42 degrees

Specific Gravity of Riprap: 2.65

Result Parameters

Overtopping Depth: 0.534518 ft

Depth determined from rectangular weir equation

Unit Discharge: 1.31579 cfs

Slope: 0.25 ft/ft

Slope Angle: 14.0362 degrees

Smallest Possible Median Rock Size: 3.57824 in

Interstitial Velocity: 0.892378 ft/s

Average Velocity: 0.40157 ft/s

Thickness required for all flow to pass thru Riprap: 3.27661 ft

Allowable Flow Depth over the Riprap: 0.19911 ft

Manning's Roughness Coefficient (n): 0.0306974

Unit Discharge over Riprap using Manning's Equation: 1.64327 cfs/ft

2300-61

Required Interstitial Flow through the Riprap: 0 cfs/ft

Flow Provided by a riprap thickness of 2*d50: 0.435034 cfs/ft

Thickness required for Flow: 2*d50

Riprap Class

Riprap Name: CLASS I

Riprap Class: I

The following values are an 'average' of the size fraction range for the selected riprap class.

d100: 12 in

d85: 9 in

d50: 6.5 in

d15: 4.5 in

Report for channel

Channel Analysis: Channel Analysis

Notes:

Input Parameters

Channel Type: Trapezoidal

Side Slope 1 (Z1): 4.0000 ft/ft

Side Slope 2 (Z2): 4.0000 ft/ft

Channel Width: 30.0000 ft

Longitudinal Slope: 0.0200 ft/ft

Manning's n: 0.0350

Lining Type: Rock Riprap - 150 mm (6-inch)

Flow: 50.0000 cfs

Result Parameters

Depth: 0.4578 ft

Area of Flow: 14.5717 ft^2

Wetted Perimeter: 33.7750 ft

Hydraulic Radius: 0.4314 ft

Average Velocity: 3.4313 ft/s

Top Width: 33.6622 ft

Froude Number: 0.9191

Critical Depth: 0.4334 ft

Critical Velocity: 3.6357 ft/s

Critical Slope: 0.0241 ft/ft

Critical Top Width: 33.47 ft

Calculated Max Shear Stress: 0.5713 lb/ft^2

Calculated Avg Shear Stress: 0.5384 lb/ft^2

No channel used in calculations

Heath Pond Special Use
Newcomb Township, Champaign County, Illinois

Storage Calculations

Modified Rational Method
Developed 1 yr. storm w/ release rate from average weir outlet flow

Runoff Coeff. C	Storm Duration T (min)	Intensity I (in/hr)	Area A (Acres)	Inflow Rate Qi (cfs)	Average Outlet Flow Qo (cfs)	Storage Rate (Qi-Qo) (cfs)	Storage (Qi-Qo)Tx60 (Cu. Ft.)
0.24	5	3.60	56.5	48.82	1.48	47.34	14201
0.24	10	3.24	56.5	43.93	1.48	42.45	25473
0.24	15	2.68	56.5	36.34	1.48	34.86	31375
0.24	20	2.25	56.5	30.51	1.48	29.03	34836
0.24	25	1.99	56.5	27.01	1.48	25.53	38297
0.24	30	1.82	56.5	24.68	1.48	23.20	41759
0.24	35	1.63	56.5	22.12	1.48	20.64	43349
0.24	40	1.49	56.5	20.20	1.48	18.72	44939
0.24	45	1.38	56.5	18.71	1.48	17.23	46529
0.24	50	1.29	56.5	17.52	1.48	16.04	48119
0.24	55	1.22	56.5	16.54	1.48	15.06	49709
0.24	60	1.16	56.5	15.73	1.48	14.25	51299
0.24	70	1.04	56.5	14.06	1.48	12.58	52851
0.24	80	0.95	56.5	12.81	1.48	11.33	54404
0.24	90	0.87	56.5	11.84	1.48	10.36	55957
0.24	100	0.82	56.5	11.06	1.48	9.58	57510
0.24	110	0.77	56.5	10.43	1.48	8.95	59063
0.24	120	0.73	56.5	9.90	1.48	8.42	60615
0.24	180	0.53	56.5	7.14	1.48	5.66	61145
0.24	270	0.38	56.5	5.17	1.48	3.69	59743
0.24	360	0.31	56.5	4.18	1.48	2.70	58342
0.24	720	0.18	56.5	2.43	1.48	0.95	41018
0.24	1080	0.13	56.5	1.71	1.48	0.23	14908
0.24	1440	0.10	56.5	1.40	1.48	0.00	0
0.24	2880	0.06	56.5	0.80	1.48	0.00	0
0.24	4320	0.04	56.5	0.58	1.48	0.00	0

Water Surface Elevation	708.3	feet
Peak Outlet Flow	4.20	cfs
Peak Basin Volume	61145	cu. ft.
	1.404	ac. ft.

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J:\2300\-61\2300-61 Mod Rat Storage.xls

Heath Pond Special Use
Newcomb Township, Champaign County, Illinois

Storage Calculations

Modified Rational Method
Developed 2 yr. storm w/ release rate from average weir outlet flow

Runoff Coeff. C	Storm Duration T (min)	Intensity I (in/hr)	Area A (Acres)	Inflow Rate Qi (cfs)	Average Outlet Flow Qo (cfs)	Storage Rate (Qi-Qo) (cfs)	Storage (Qi-Qo)Tx60 (Cu. Ft.)
0.24	5	4.32	56.5	58.58	1.97	56.61	16983
0.24	10	3.96	56.5	53.70	1.97	51.73	31037
0.24	15	3.24	56.5	43.93	1.97	41.96	37768
0.24	20	2.73	56.5	37.02	1.97	35.05	42059
0.24	25	2.42	56.5	32.87	1.97	30.90	46345
0.24	30	2.22	56.5	30.10	1.97	28.13	50640
0.24	35	1.99	56.5	26.97	1.97	25.00	52493
0.24	40	1.82	56.5	24.61	1.97	22.64	54339
0.24	45	1.68	56.5	22.78	1.97	20.81	56189
0.24	50	1.57	56.5	21.32	1.97	19.35	58039
0.24	55	1.48	56.5	20.12	1.97	18.15	59886
0.24	60	1.41	56.5	19.12	1.97	17.15	61739
0.24	70	1.26	56.5	17.10	1.97	15.13	63565
0.24	80	1.15	56.5	15.60	1.97	13.63	65414
0.24	90	1.06	56.5	14.42	1.97	12.45	67224
0.24	100	0.99	56.5	13.48	1.97	11.51	69050
0.24	110	0.94	56.5	12.71	1.97	10.74	70882
0.24	120	0.89	56.5	12.07	1.97	10.10	72708
0.24	180	0.64	56.5	8.72	1.97	6.75	72939
0.24	270	0.49	56.5	6.64	1.97	4.67	75725
0.24	360	0.38	56.5	5.15	1.97	3.18	68748
0.24	720	0.22	56.5	2.98	1.97	1.01	43770
0.24	1080	0.15	56.5	2.03	1.97	0.06	4147
0.24	1440	0.13	56.5	1.76	1.97	0.00	0
0.24	2880	0.07	56.5	0.95	1.97	0.00	0
0.24	4320	0.05	56.5	0.71	1.97	0.00	0

Water Surface Elevation	708.4	feet
Peak Outlet Flow	5.7	cfs
Peak Basin Volume	75725	cu. ft.
	1.738	ac. ft.

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Heath Pond Special Use

Newcomb Township, Champaign County, Illinois

Storage Calculations

Modified Rational Method

Developed 5 yr. storm w/ release rate from average weir outlet flow

Runoff Coeff. C	Storm Duration T (min)	Intensity I (in/hr)	Area A (Acres)	Inflow Rate Qi (cfs)	Average Outlet Flow Qo (cfs)	Storage Rate (Qi-Qo) (cfs)	Storage (Qi-Qo)Tx60 (Cu. Ft.)
0.24	5	5.28	56.5	71.60	2.6	69.00	20699
0.24	10	4.86	56.5	65.90	2.6	63.30	37981
0.24	15	4.00	56.5	54.24	2.6	51.64	46476
0.24	20	3.37	56.5	45.70	2.6	43.10	51717
0.24	25	2.99	56.5	40.57	2.6	37.97	56952
0.24	30	2.74	56.5	37.15	2.6	34.55	62198
0.24	35	2.45	56.5	33.28	2.6	30.68	64432
0.24	40	2.24	56.5	30.37	2.6	27.77	66659
0.24	45	2.07	56.5	28.11	2.6	25.51	68889
0.24	50	1.94	56.5	26.31	2.6	23.71	71119
0.24	55	1.83	56.5	24.83	2.6	22.23	73347
0.24	60	1.74	56.5	23.59	2.6	20.99	75580
0.24	70	1.56	56.5	21.09	2.6	18.49	77679
0.24	80	1.42	56.5	19.23	2.6	16.63	79805
0.24	90	1.31	56.5	17.76	2.6	15.16	81883
0.24	100	1.22	56.5	16.60	2.6	14.00	83983
0.24	110	1.15	56.5	15.64	2.6	13.04	86088
0.24	120	1.10	56.5	14.85	2.6	12.25	88187
0.24	180	0.79	56.5	10.71	2.6	8.11	87614
0.24	270	0.60	56.5	8.14	2.6	5.54	89683
0.24	360	0.46	56.5	6.24	2.6	3.64	78572
0.24	720	0.27	56.5	3.66	2.6	1.06	45844
0.24	1080	0.19	56.5	2.58	2.6	0.00	0
0.24	1440	0.16	56.5	2.10	2.6	0.00	0
0.24	2880	0.09	56.5	1.18	2.6	0.00	0
0.24	4320	0.06	56.5	0.85	2.6	0.00	0

Water Surface Elevation	708.5	feet
Peak Outlet Flow	7.4	cfs
Peak Basin Volume	89683	cu. ft.
	2.059	ac. ft.

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Heath Pond Special Use
Newcomb Township, Champaign County, Illinois

Storage Calculations

Modified Rational Method
Developed 10 yr. storm w/ release rate from average weir outlet flow

Runoff Coeff. C	Storm Duration T (min)	Intensity I (in/hr)	Area A (Acres)	Inflow Rate Qi (cfs)	Average Outlet Flow Qo (cfs)	Storage Rate (Qi-Qo) (cfs)	Storage (Qi-Qo)Tx60 (Cu. Ft.)
0.24	5	6.12	56.5	82.99	3.1	79.89	23966
0.24	10	5.64	56.5	76.48	3.1	73.38	44027
0.24	15	4.56	56.5	61.83	3.1	58.73	52860
0.24	20	3.85	56.5	52.21	3.1	49.11	58927
0.24	25	3.42	56.5	46.43	3.1	43.33	64989
0.24	30	3.14	56.5	42.58	3.1	39.48	71061
0.24	35	2.81	56.5	38.16	3.1	35.06	73634
0.24	40	2.57	56.5	34.85	3.1	31.75	76198
0.24	45	2.38	56.5	32.27	3.1	29.17	78767
0.24	50	2.23	56.5	30.21	3.1	27.11	81335
0.24	55	2.10	56.5	28.52	3.1	25.42	83900
0.24	60	2.00	56.5	27.12	3.1	24.02	86472
0.24	70	1.79	56.5	24.25	3.1	21.15	88840
0.24	80	1.63	56.5	22.11	3.1	19.01	91240
0.24	90	1.51	56.5	20.43	3.1	17.33	93584
0.24	100	1.41	56.5	19.09	3.1	15.99	95953
0.24	110	1.33	56.5	18.00	3.1	14.90	98328
0.24	120	1.26	56.5	17.09	3.1	13.99	100696
0.24	180	0.91	56.5	12.34	3.1	9.24	99788
0.24	270	0.69	56.5	9.36	3.1	6.26	101354
0.24	360	0.53	56.5	7.19	3.1	4.09	88275
0.24	720	0.31	56.5	4.20	3.1	1.10	47676
0.24	1080	0.22	56.5	2.98	3.1	0.00	0
0.24	1440	0.18	56.5	2.44	3.1	0.00	0
0.24	2880	0.10	56.5	1.36	3.1	0.00	0
0.24	4320	0.07	56.5	0.98	3.1	0.00	0

Water Surface Elevation	708.6	feet
Peak Outlet Flow	8.7	cfs
Peak Basin Volume	101354	cu. ft.
	2.327	ac. ft.

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Heath Pond Special Use
Newcomb Township, Champaign County, Illinois

Storage Calculations

Modified Rational Method
Developed 25 yr. storm w/ release rate from average weir outlet flow

Runoff Coeff. C	Storm Duration T (min)	Intensity I (in/hr)	Area A (Acres)	Inflow Rate Qi (cfs)	Average Outlet Flow Qo (cfs)	Storage Rate (Qi-Qo) (cfs)	Storage (Qi-Qo)Tx60 (Cu. Ft.)
0.26	5	7.32	56.5	#####	4.2	103.33	30999
0.26	10	6.72	56.5	98.72	4.2	94.52	56710
0.26	15	5.48	56.5	80.50	4.2	76.30	68671
0.26	20	4.61	56.5	67.72	4.2	63.52	76225
0.26	25	4.09	56.5	60.05	4.2	55.85	83772
0.26	30	3.74	56.5	54.94	4.2	50.74	91333
0.26	35	3.35	56.5	49.28	4.2	45.08	94662
0.26	40	3.07	56.5	45.02	4.2	40.82	97980
0.26	45	2.84	56.5	41.72	4.2	37.52	101303
0.26	50	2.66	56.5	39.08	4.2	34.88	104626
0.26	55	2.51	56.5	36.91	4.2	32.71	107945
0.26	60	2.39	56.5	35.11	4.2	30.91	111273
0.26	70	2.13	56.5	31.31	4.2	27.11	113861
0.26	80	1.94	56.5	28.47	4.2	24.27	116491
0.26	90	1.79	56.5	26.25	4.2	22.05	119049
0.26	100	1.67	56.5	24.47	4.2	20.27	121638
0.26	110	1.57	56.5	23.02	4.2	18.82	124236
0.26	120	1.49	56.5	21.81	4.2	17.61	126825
0.26	180	1.07	56.5	15.77	4.2	11.57	124926
0.26	270	0.81	56.5	11.90	4.2	7.70	124722
0.26	360	0.63	56.5	9.25	4.2	5.05	109182
0.26	720	0.37	56.5	5.44	4.2	1.24	53365
0.26	1080	0.26	56.5	3.82	4.2	0.00	0
0.26	1440	0.21	56.5	3.08	4.2	0.00	0
0.26	2880	0.12	56.5	1.76	4.2	0.00	0
0.26	4320	0.09	56.5	1.26	4.2	0.00	0

Water Surface Elevation	708.7	feet
Peak Outlet Flow	11.8	cfs
Peak Basin Volume	126825	cu. ft.
	2.912	ac. ft.

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Heath Pond Special Use
Newcomb Township, Champaign County, Illinois

Storage Calculations

Modified Rational Method
Developed 50 yr. storm w/ release rate from average weir outlet flow

Runoff Coeff. C	Storm Duration T (min)	Intensity I (in/hr)	Area A (Acres)	Inflow Rate Qi (cfs)	Average Outlet Flow Qo (cfs)	Storage Rate (Qi-Qo) (cfs)	Storage (Qi-Qo)Tx60 (Cu. Ft.)
0.29	5	8.40	56.5	#####	7.76	129.87	38962
0.29	10	7.68	56.5	#####	7.76	118.08	70846
0.29	15	6.40	56.5	#####	7.76	97.10	87394
0.29	20	5.36	56.5	87.82	7.76	80.06	96076
0.29	25	4.74	56.5	77.59	7.76	69.83	104750
0.29	30	4.32	56.5	70.78	7.76	63.02	113442
0.29	35	3.87	56.5	63.39	7.76	55.63	116823
0.29	40	3.53	56.5	57.84	7.76	50.08	120190
0.29	45	3.27	56.5	53.52	7.76	45.76	123564
0.29	50	3.06	56.5	50.07	7.76	42.31	126938
0.29	55	2.88	56.5	47.25	7.76	39.49	130306
0.29	60	2.74	56.5	44.89	7.76	37.13	133686
0.29	70	2.45	56.5	40.12	7.76	32.36	135907
0.29	80	2.23	56.5	36.55	7.76	28.79	138181
0.29	90	2.06	56.5	33.75	7.76	25.99	140363
0.29	100	1.92	56.5	31.52	7.76	23.76	142585
0.29	110	1.81	56.5	29.70	7.76	21.94	144818
0.29	120	1.72	56.5	28.18	7.76	20.42	147040
0.29	180	1.25	56.5	20.43	7.76	12.67	136800
0.29	270	0.94	56.5	15.40	7.76	7.64	123799
0.29	360	0.73	56.5	11.96	7.76	4.20	90743
0.29	720	0.42	56.5	6.88	7.76	0.00	0
0.29	1080	0.30	56.5	4.92	7.76	0.00	0
0.29	1440	0.24	56.5	3.93	7.76	0.00	0
0.29	2880	0.13	56.5	2.18	7.76	0.00	0
0.29	4320	0.10	56.5	1.59	7.76	0.00	0

Water Surface Elevation	708.8	feet
Peak Outlet Flow	22.0	cfs
Peak Basin Volume	147040	cu. ft.
	3.376	ac. ft.

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Heath Pond Special Use
Newcomb Township, Champaign County, Illinois

Storage Calculations

Modified Rational Method
Developed 100 yr. storm w/ release rate from average weir outlet flow

Runoff Coeff. C	Storm Duration T (min)	Intensity I (in/hr)	Area A (Acres)	Inflow Rate Qi (cfs)	Average Outlet Flow Qo (cfs)	Storage Rate (Qi-Qo) (cfs)	Storage (Qi-Qo)Tx60 (Cu. Ft.)
0.3	5	9.48	56.5	#####	11.92	148.77	44630
0.3	10	8.76	56.5	#####	11.92	136.56	81937
0.3	15	7.40	56.5	#####	11.92	113.51	102159
0.3	20	6.15	56.5	#####	11.92	92.32	110787
0.3	25	5.40	56.5	91.52	11.92	79.60	119404
0.3	30	4.90	56.5	83.06	11.92	71.14	128043
0.3	35	4.39	56.5	74.39	11.92	62.47	131188
0.3	40	4.01	56.5	67.88	11.92	55.96	134315
0.3	45	3.71	56.5	62.83	11.92	50.91	137452
0.3	50	3.47	56.5	58.78	11.92	46.86	140588
0.3	55	3.27	56.5	55.47	11.92	43.55	143717
0.3	60	3.11	56.5	52.71	11.92	40.79	146860
0.3	70	2.78	56.5	47.10	11.92	35.18	147737
0.3	80	2.53	56.5	42.89	11.92	30.97	148676
0.3	90	2.34	56.5	39.61	11.92	27.69	149507
0.3	100	2.18	56.5	36.98	11.92	25.06	150385
0.3	110	2.06	56.5	34.84	11.92	22.92	151276
0.3	120	1.95	56.5	33.05	11.92	21.13	152154
0.3	180	1.41	56.5	23.90	11.92	11.98	129379
0.3	270	1.06	56.5	17.97	11.92	6.05	97961
0.3	360	0.83	56.5	14.07	11.92	2.15	46408
0.3	720	0.48	56.5	8.14	11.92	0.00	0
0.3	1080	0.34	56.5	5.76	11.92	0.00	0
0.3	1440	0.28	56.5	4.66	11.92	0.00	0
0.3	2880	0.15	56.5	2.54	11.92	0.00	0
0.3	4320	0.11	56.5	1.85	11.92	0.00	0

Water Surface Elevation	708.9	feet
Peak Outlet Flow	33.8	cfs
Peak Basin Volume	152154	cu. ft.
	3.493	ac. ft.

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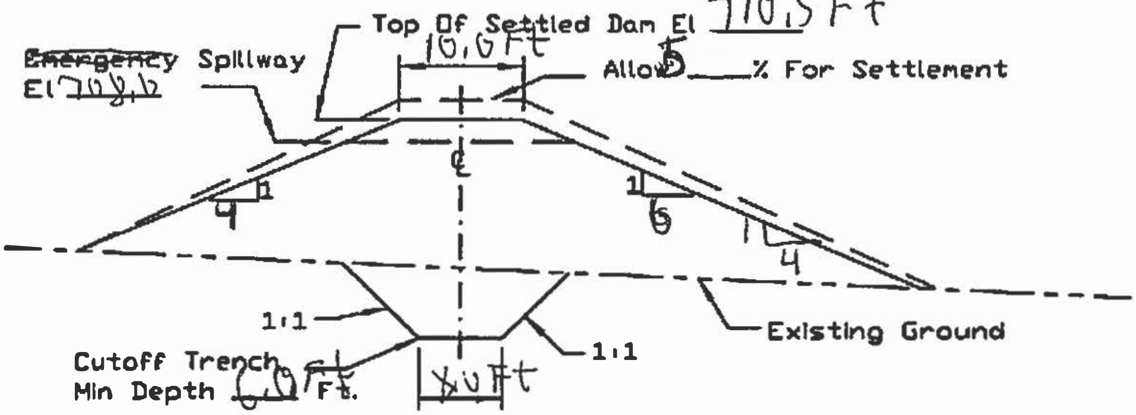
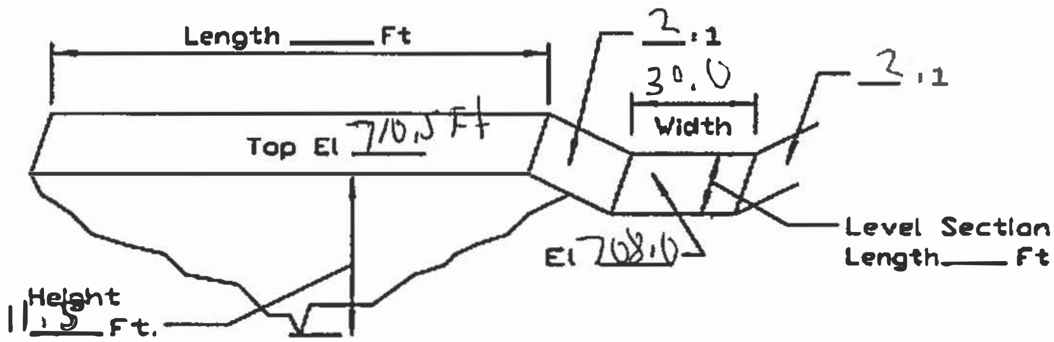
EARTH DAM STRUCTURE PLAN

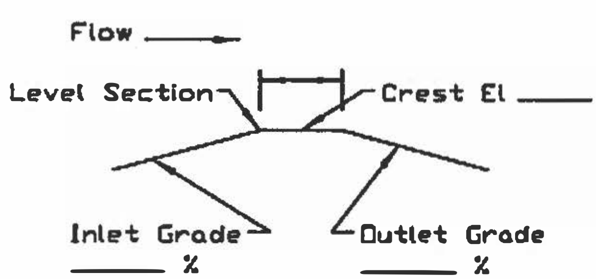
IDOT PERMIT REQUIRED Yes ___ No X



MAXIMUM CROSS SECTION OF DAM

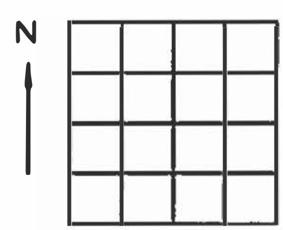


SKETCH OF DAM



PROFILE ON CENTERLINE OF EMERGENCY SPILLWAY

LOCATION MAP



Sec. ___ T. ___ R. ___
B.M. Elevation ___
B.M. Description ___

REFERENCE Project ___ Designed ___ Date ___ Checked ___ Date ___ Approved ___ Date ___	NRCS Natural Resources Conservation Service	STANDARD DWG. NO. IL-585 SHEET 1 OF 2 DATE 3-3-95

EARTH DAM STRUCTURE PLAN

ESTIMATED TABLE OF QUANTITIES		
ITEM	UNIT	QUANTITY
Total Earth Fill	Cu. Yd.	
Excavation- Cutoff Trench	Cu. Yd.	
Excavation-Emergency Spillway	Cu. Yd.	

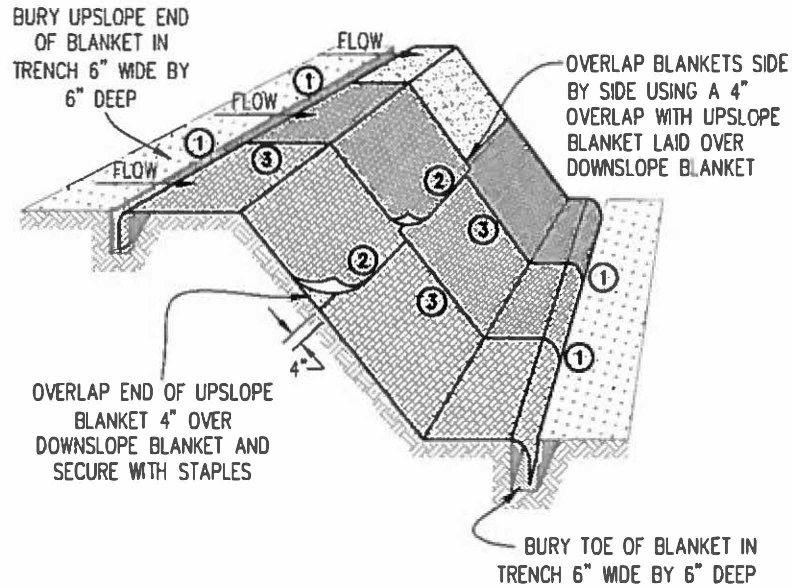
PROFILE ALONG CENTERLINE OF FILL

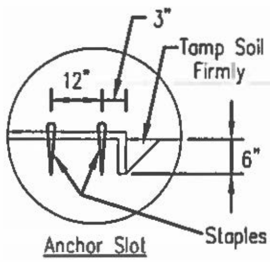
REFERENCE
Project ____________________
Designed ______________ Date ________
Checked ______________ Date ________
Approved ______________ Date ________

NRCS
Natural Resources Conservation Service

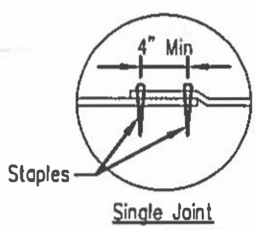
STANDARD DWG. NO.
IL-585
SHEET 2 OF 2
DATE 6-16-94

AUTOCAD2006

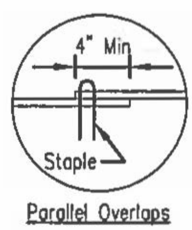




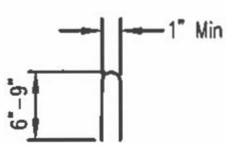
DETAIL 1



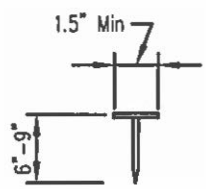
DETAIL 2



DETAIL 3



STAPLE DETAIL



PUSH PIN DETAIL

NOTES:

1. Staples shall be placed in a diamond pattern at 2 per s.y. for stiched blankets. Non-stiched shall use 4 staples per s.y. of material. This equates to 200 staples with stiched blanket and 400 stapels with non-stiched blanket per 100 s.y. of material.

2. Staple or push pin lengths shall be selected based on soil type and conditions. (minimum staple length is 6")

3. Erosion control material shall be placed in contact with the soil over a prepared seedbed.

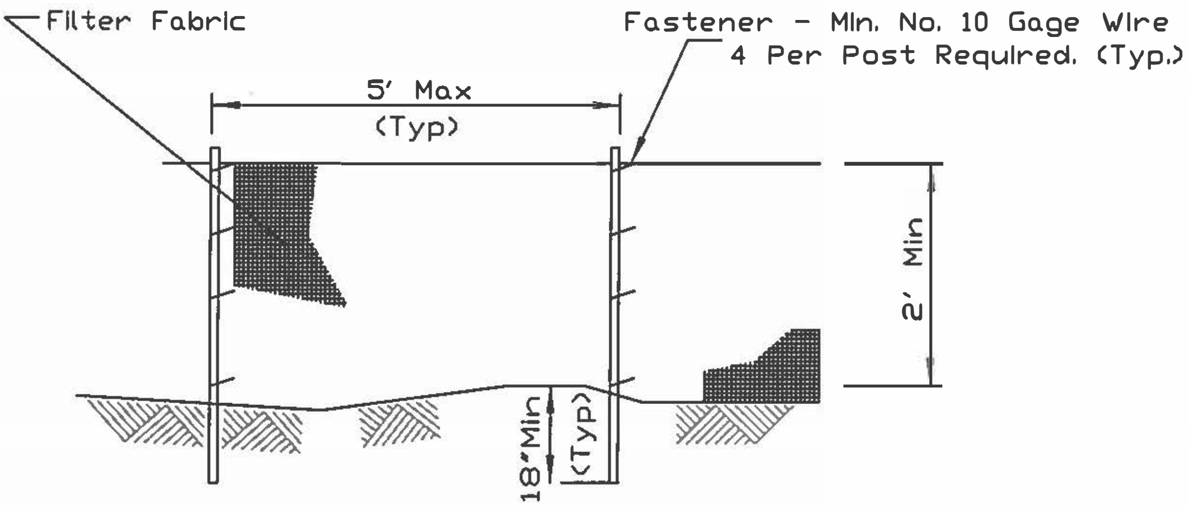
4. All anchor slots shall be stapled at approximately 12" intervals.

Sheet 1 of 1
File No. / Drawing No. IUM-530

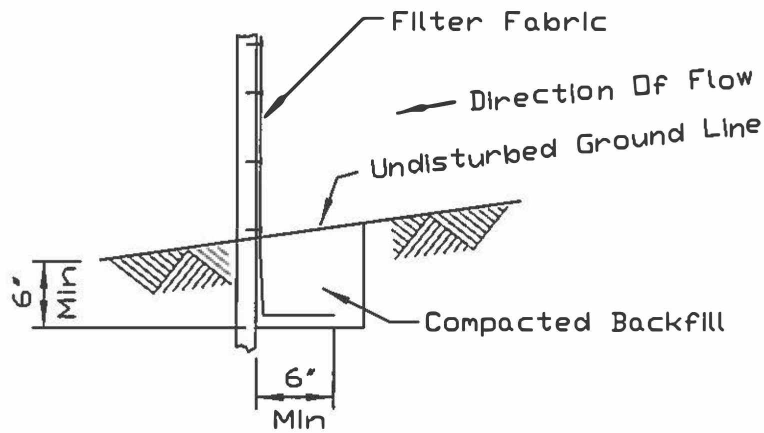
EROSION CONTROL
BLANKET INSTALLATION DETAILS

		Date
Designed		
Drawn	B. JOHNSON	11/08
Checked		
Approved		

SILT FENCE PLAN



ELEVATION



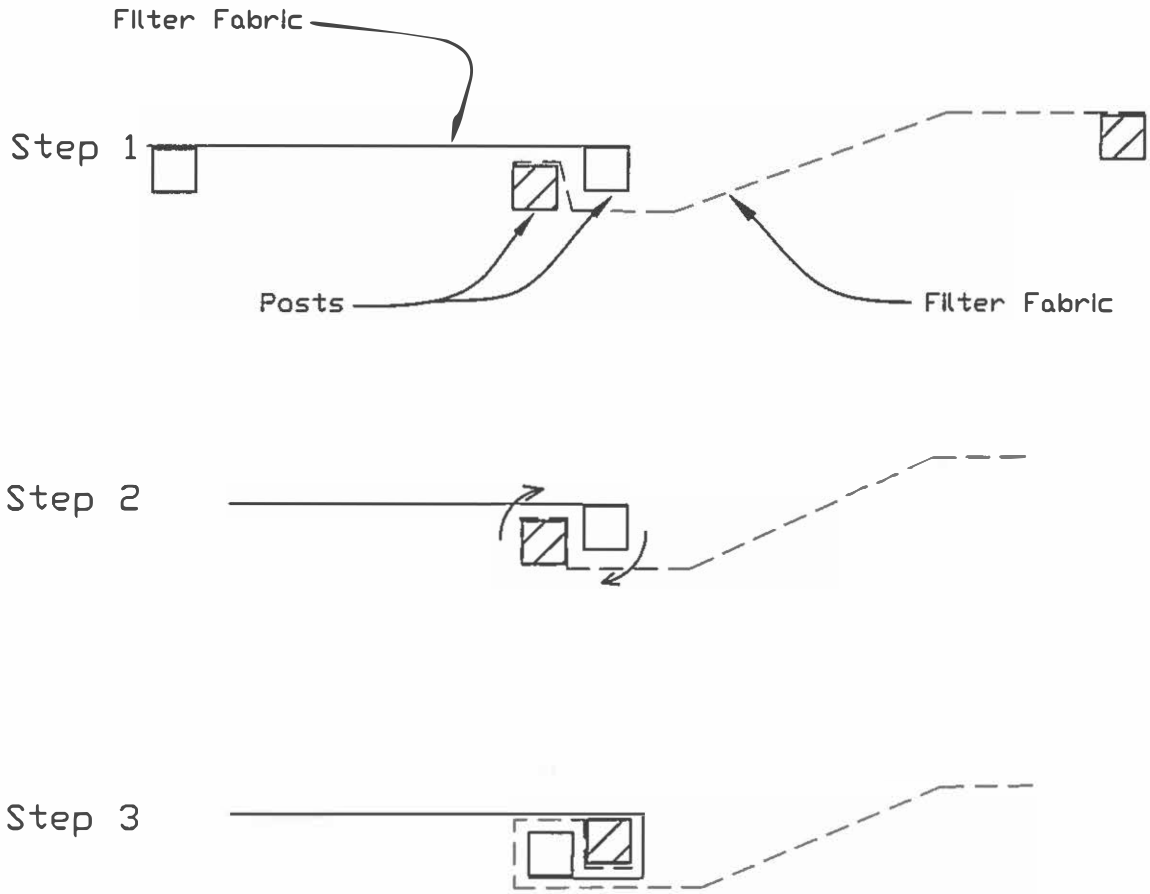
FABRIC ANCHOR DETAIL

NOTES:

1. Temporary sediment fence shall be installed prior to any grading work in the area to be protected. They shall be maintained throughout the construction period and removed in conjunction with the final grading and site stabilization.
2. Filter fabric shall meet the requirements of material specification 592 Geotextile Table 1 or 2, Class I with equivalent opening size of at least 30 for nonwoven and 40 for woven.
3. Fence posts shall be either standard steel post or wood post with a minimum cross-sectional area of 3.0 sq. in.

REFERENCE		STANDARD DWG. NO.
Project ______		IUM-620A
Designed ______ Date ______		SHEET 1 OF 2
Checked ______ Date ______		DATE 3-16-12
Approved ______ Date ______		

SILT FENCE - SPLICING TWO FENCES

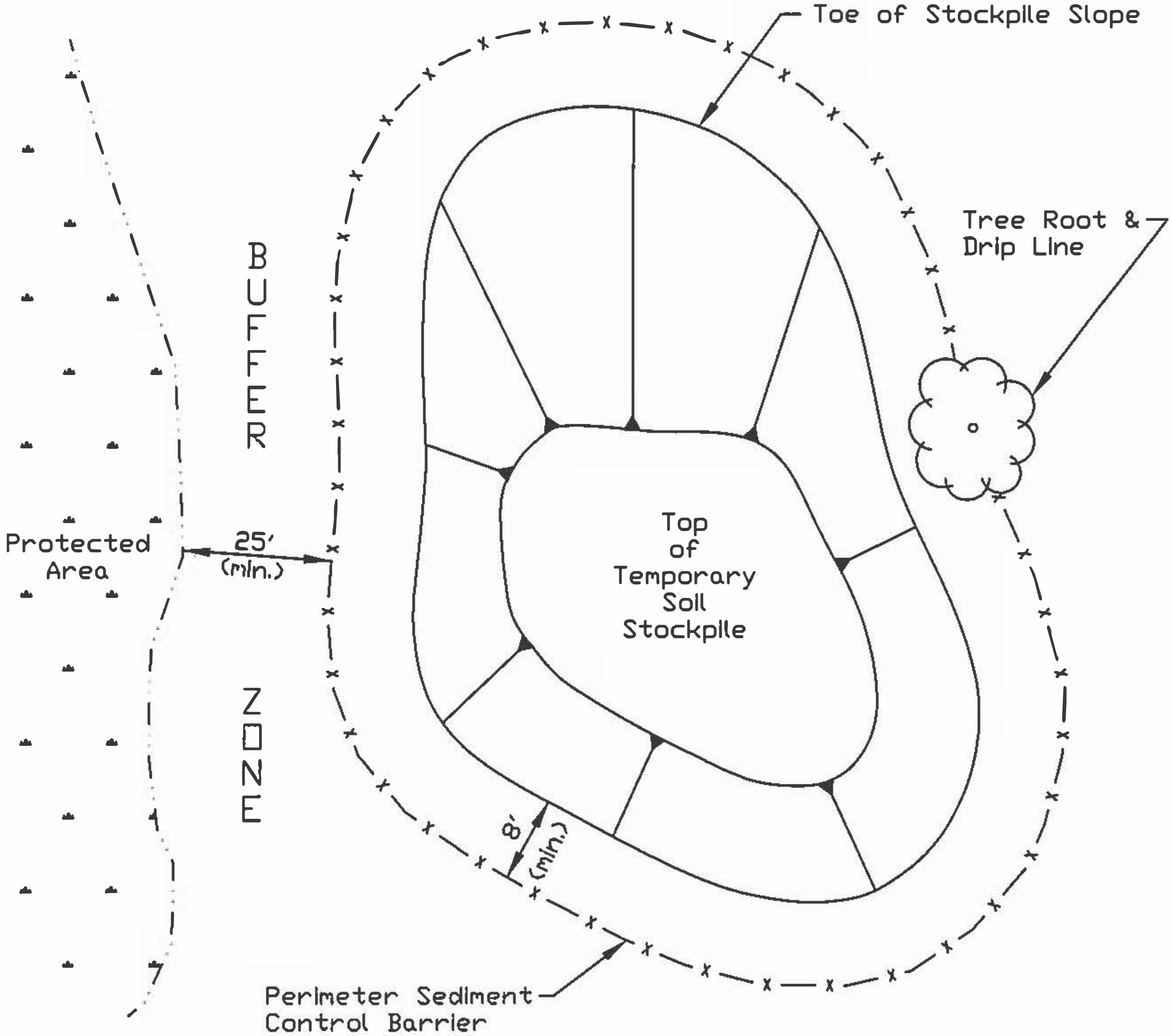


ATTACHING TWO SILT FENCES

1. Place the end post of the second fence inside the end post of the first fence.
2. Rotate both posts at least 180 degrees in a clockwise direction to create a tight seal with the fabric material.
3. Cut the fabric near the bottom of the stakes to accommodate the 6" flap.
4. Drive both posts a minimum of 18 inches into the ground and bury the flap.
5. Compact backfill (particularly at splices) completely to prevent stormwater piping.

REFERENCE		STANDARD DWG. NO.
Project ______		IUM-620B(W)
Designed ______ Date ______		SHEET 1 OF 1
Checked ______ Date ______		
Approved ______ Date ______		DATE 3-16-2012

TEMPORARY SOIL STOCKPILE DETAIL

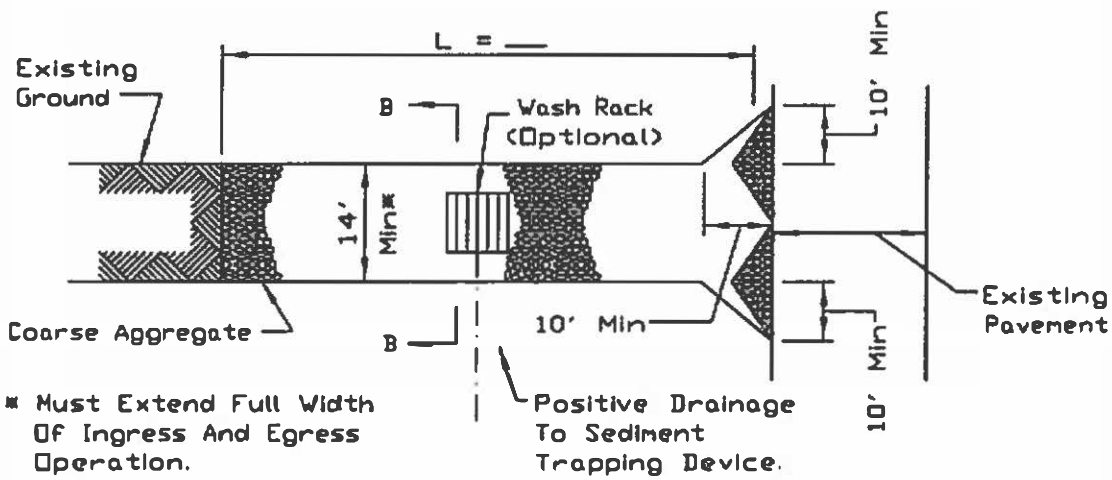


NOTES:

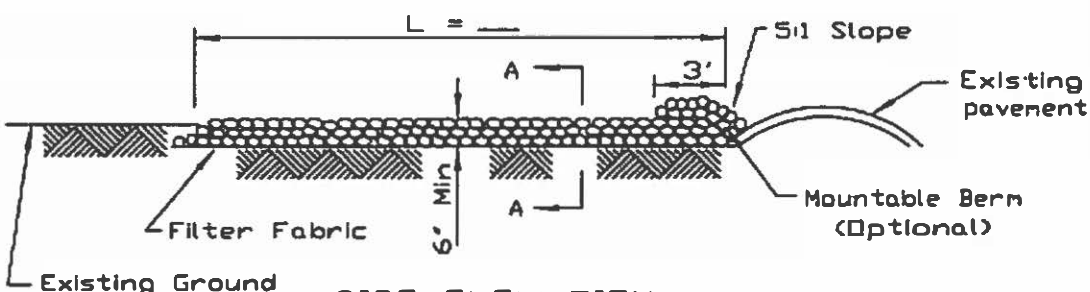
1. Stockpile slopes should be based on angle of repose of the soil material to avoid potential sloughing of the slope.
2. Soil stockpile to be stabilized in accordance with practical standards.
3. Do not locate stockpile within overland drainage flow path, designated floodways, drip line or over the root crown of adjacent trees.
4. Provisions for sediment control practices may be required along haul roads and entrance/exit locations for access the soil stockpile that can create flow path for stormwater runoff.
5. Installation of benches, terraces, or slope interrupters should be considered.
6. Avoid building soil stockpiles on impervious surfaces.
7. Linlear sediment trap surrounding the stockpile base may be used to control sediment.

REFERENCE		STANDARD DWG. NO.
Project ________		IUM-627
Designed ________ Date ______		SHEET 1 OF 1
Checked ________ Date ______		DATE JANUARY 2017
Approved ________ Date ______		

STABILIZED CONSTRUCTION ENTRANCE PLAN



PLAN VIEW



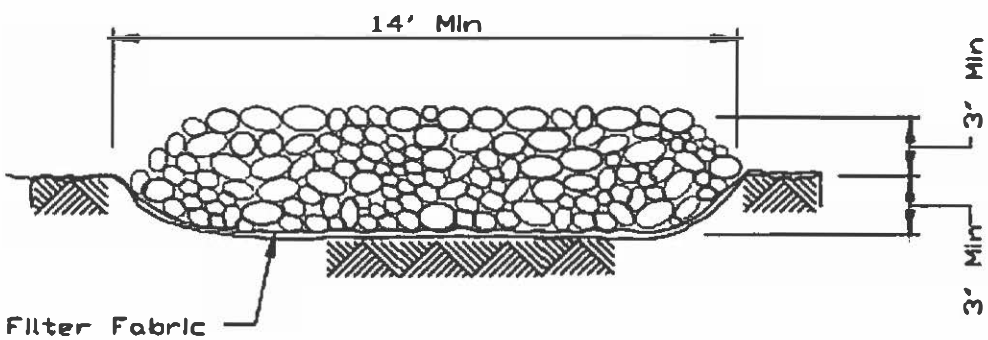
SIDE ELEVATION

NOTES:

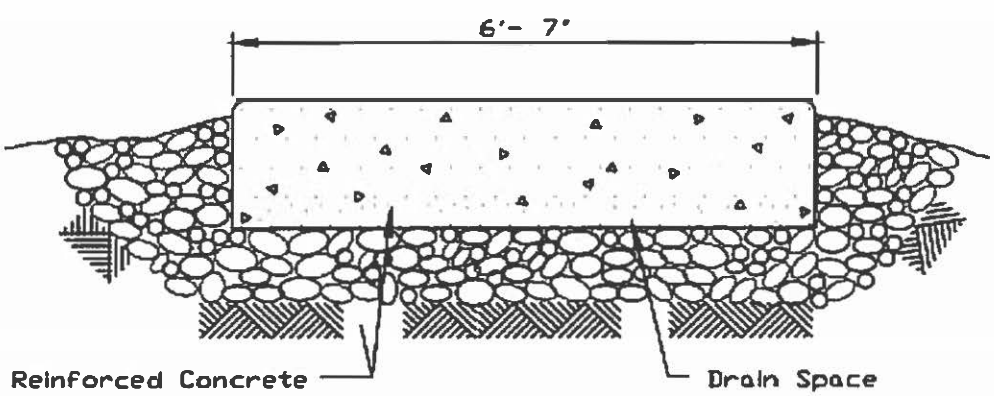
1. Filter fabric shall meet the requirements of material specification 592 GEOTEXTILE, Table I or 2, Class I, II or IV and shall be placed over the cleared area prior to the placing of rock.
2. Rock or reclaimed concrete shall meet one of the following IDOT coarse aggregate gradation, CA-1, CA-2, CA-3 or CA-4 and be placed according to construction specification 25 ROCKFILL using placement Method 1 and Class III compaction.
3. Any drainage facilities required because of washing shall be constructed according to manufacturers specifications.
4. If wash racks are used they shall be installed according to the manufacturer's specifications.

REFERENCE	NRCS Natural Resources Conservation Service	STANDARD DWG. NO. IL-630
Project ______		SHEET 1 OF 2
Designed ______ Date ____		DATE 8-18-94
Checked ______ Date ____		
Approved ______ Date ____		

STABILIZED CONSTRUCTION ENTRANCE PLAN

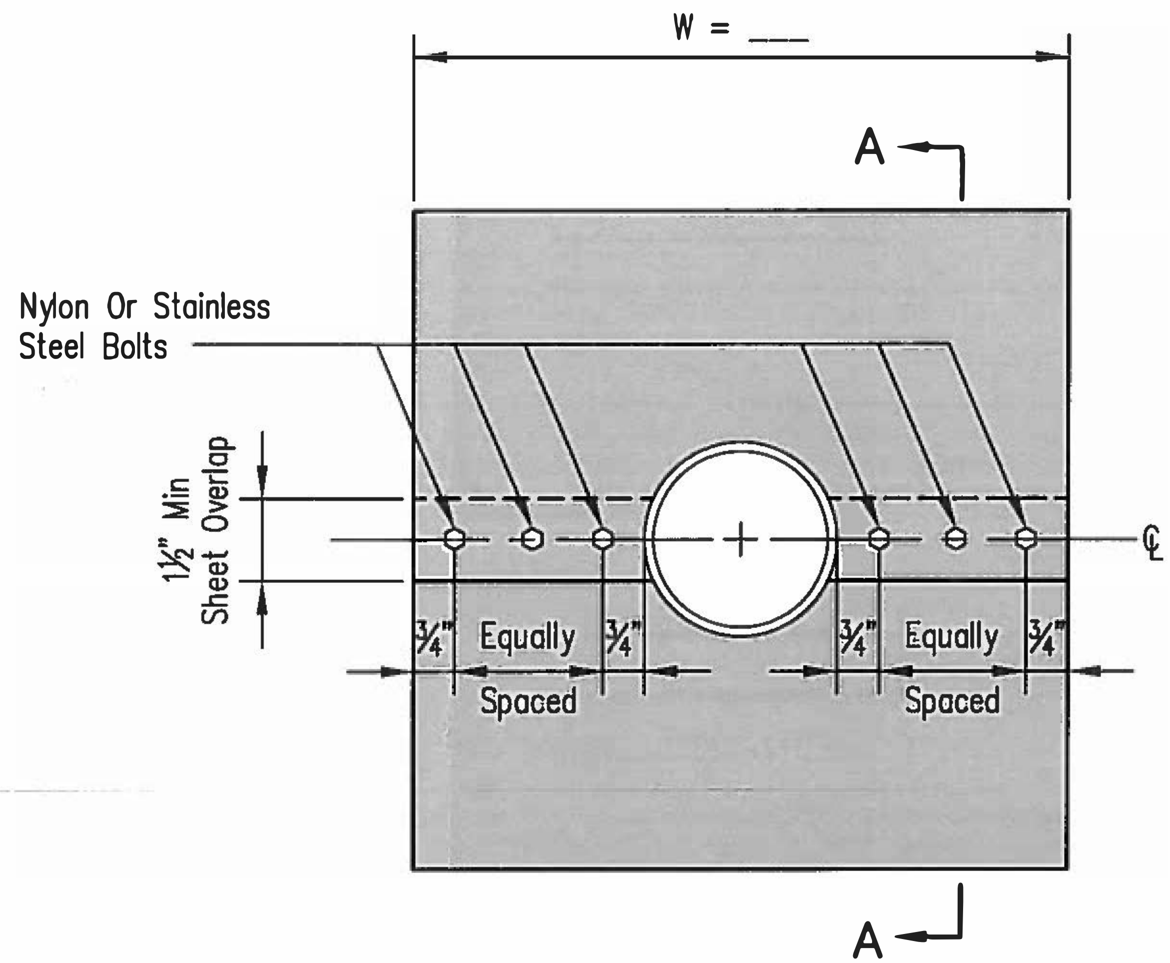


SECTION A-A



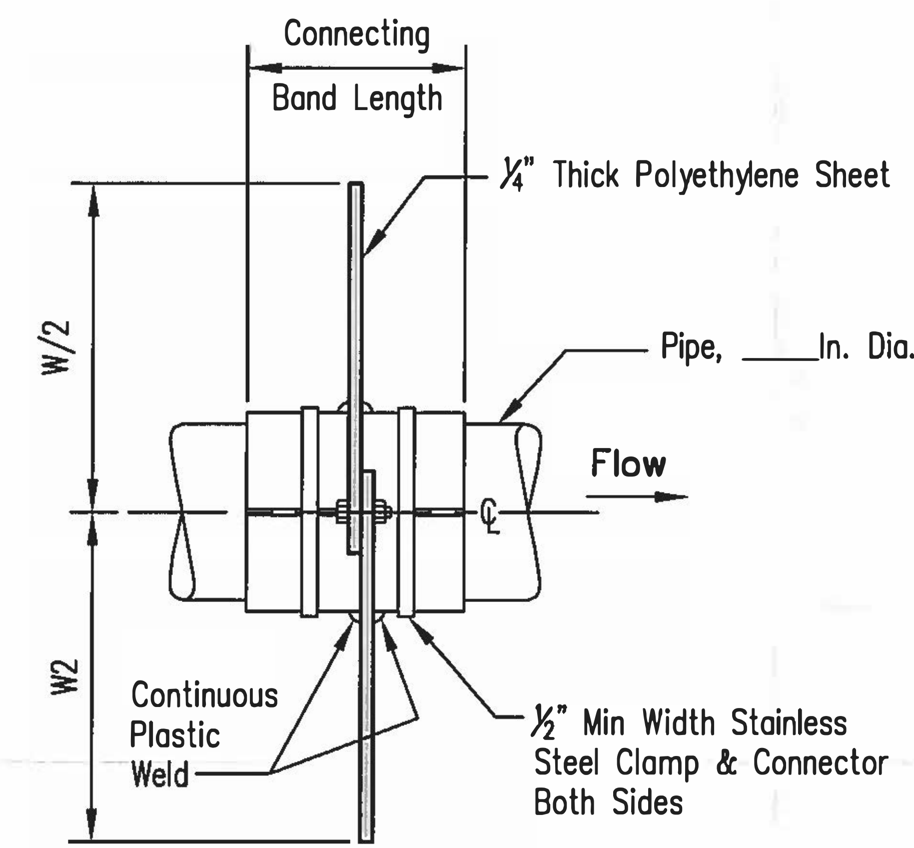
SECTION B-B

REFERENCE		NRCS	STANDARD DWG. NO.
Project ______		Natural Resources Conservation Service	IL-630
Designed ______	Date ______		SHEET 2 OF 2
Checked ______	Date ______		DATE 8-18-94
Approved ______	Date ______		



Independent

ELEVATION



SECTION A–A

NOTES:

1. Pipe, connecting band and seam coating can be either silicon caulk (recommended), or mastic (asphalt or tar based)
2. Apply silicon caulk, tar or mastic to bottom half of connecting band and lay pipe on connecting band.
   Apply silicon caulk or mastic to top half of collar and set in place, lining up bolt holes.
3. Install clamps on split halves of collar and tighten bolts and clamps.
4. Apply silicon caulk, tar or mastic on seams as needed to insure a good seal so that completed installation is watertight.
5. Backfill and hand tamp soil around completed installation.
6. Polyethylene antiseep collars can be used on corrugated and smooth PVC plastic, smooth steel and galvanized pipes.

TABLE OF QUANTITIES

W FEET	Polyethylene Sheet Sq. Ft.	Stainless Steel Clamp & Connector	Connecting Band Min Length	Bolts & Nuts ⅜"x 1"	No. Of Collars
3	9.5	2	6"	6	
4	16.7	2	6"	6	
5	25.8	2	8"	6	
6	37.0	2	8"	6	
Totals					

Adapted From Wisconsin Standard Drawing WI–246

Designed ____ Drawn M. QUINONES 11/1/13 Checked ____ Approved ____ Date

POLYETHYLENE SHEET ANTISEEP COLLAR FOR 4" TO 24" DIAMETER PIPE

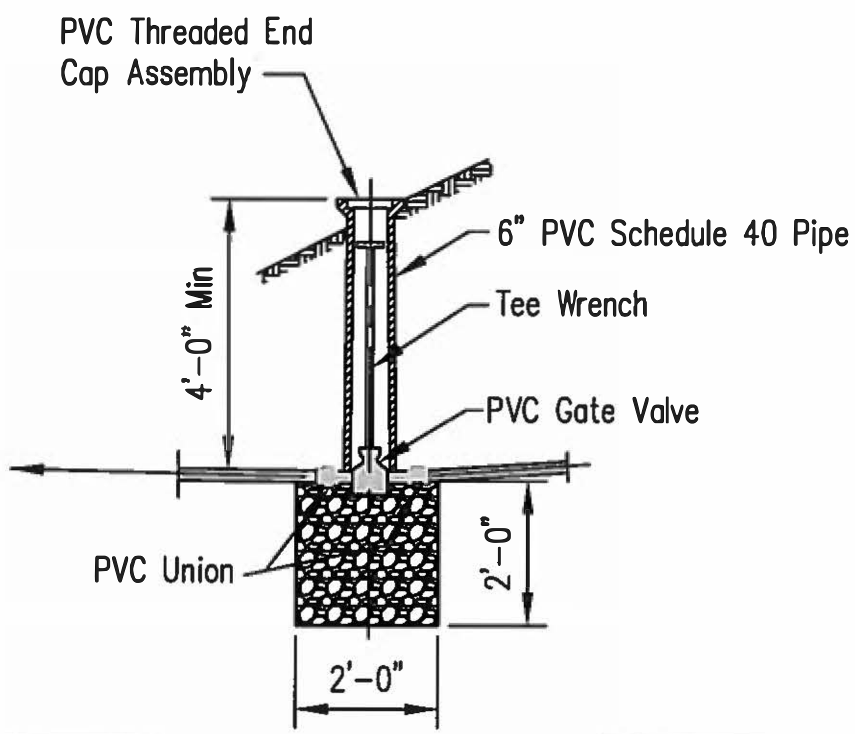
NRCS Natural Resources Conservation Service United States Department of Agriculture

File No. IL–ENG–215

Drawing No.

Page 1 of 1

Sheet of



DETAIL A
GRAVEL DRAIN

BILL OF MATERIAL		
QUANTITY	ITEM	LENGTH
	2" PVC Schedule 40 Pipe	
1	2" PVC End Cap	
1	2" PVC 90 Degree Elbow	
2	2" PVC Female Union	
	6" PVC Schedule 40 Pipe	
1	6" PVC Threaded End Cap Assembly	
1	2" PVC Gate Valve	
1	Tee Handle Valve	
	24" Perforated Corrugated Plastic Tubing (CPT)	
	Rubber Anti-Seep Collars	
	PVC Cement (Joints)	
	Pit Run Sand And Gravel (Drain) 0.34 Cu.Yd.	
	Coarse Gravel Mix (Collector)	
	Concrete (Base)	
	Marking Post (Optional)	

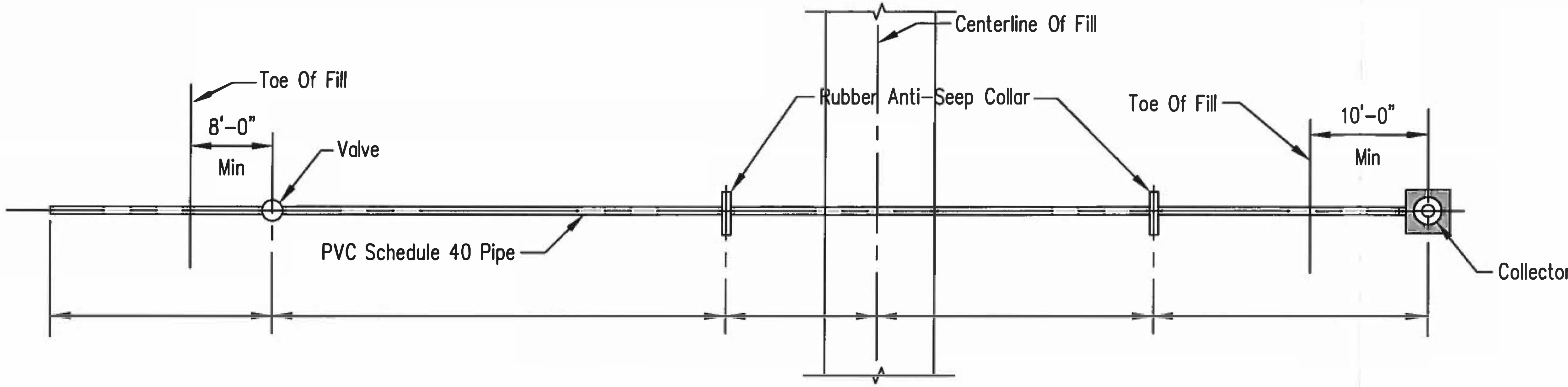
Landowner		Location	

Designed — Drawn M. QUINONES — Approved — Date 10/1/13

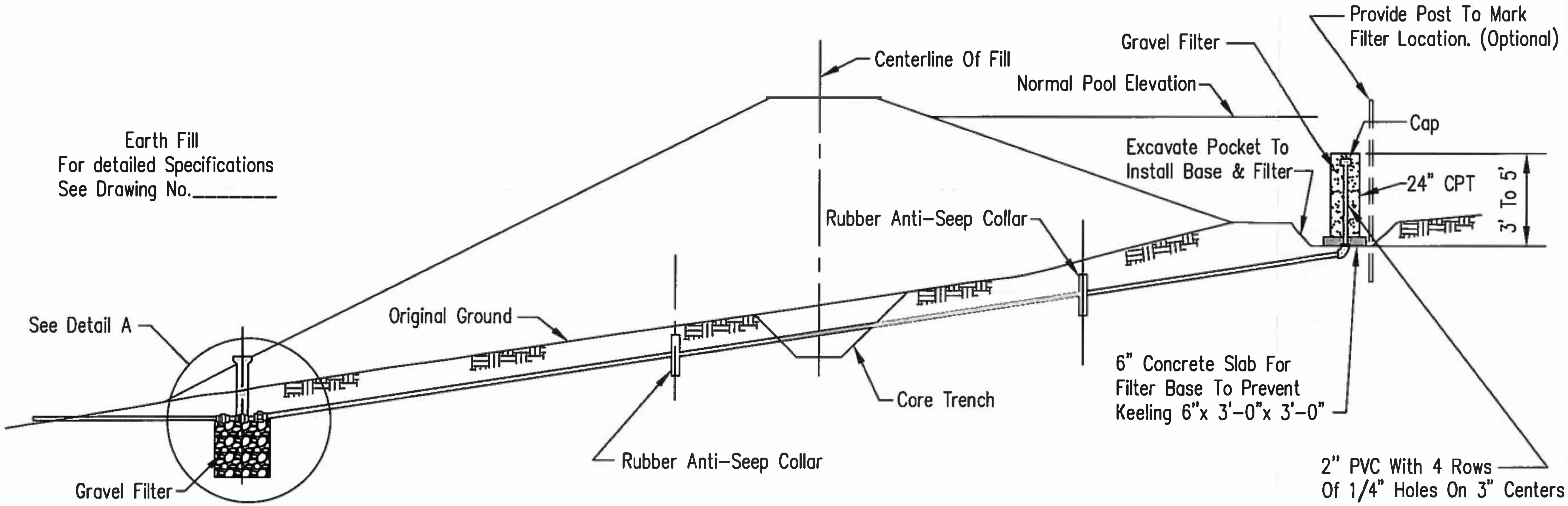
POND DEWATERING SYSTEM

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

File No. IL-ENG-175
Drawing No.
Page 2 of 2
Sheet of



PLAN



SECTION ALONG CENTERLINE OF WATER PIPE

Landowner		Location	

Designed ____ Date ____
Drawn M. QUINONES Date 10/1/13
Approved ____

POND DEWATERING SYSTEM

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

File No. IL–ENG–175
Drawing No.
Page 1 of 2
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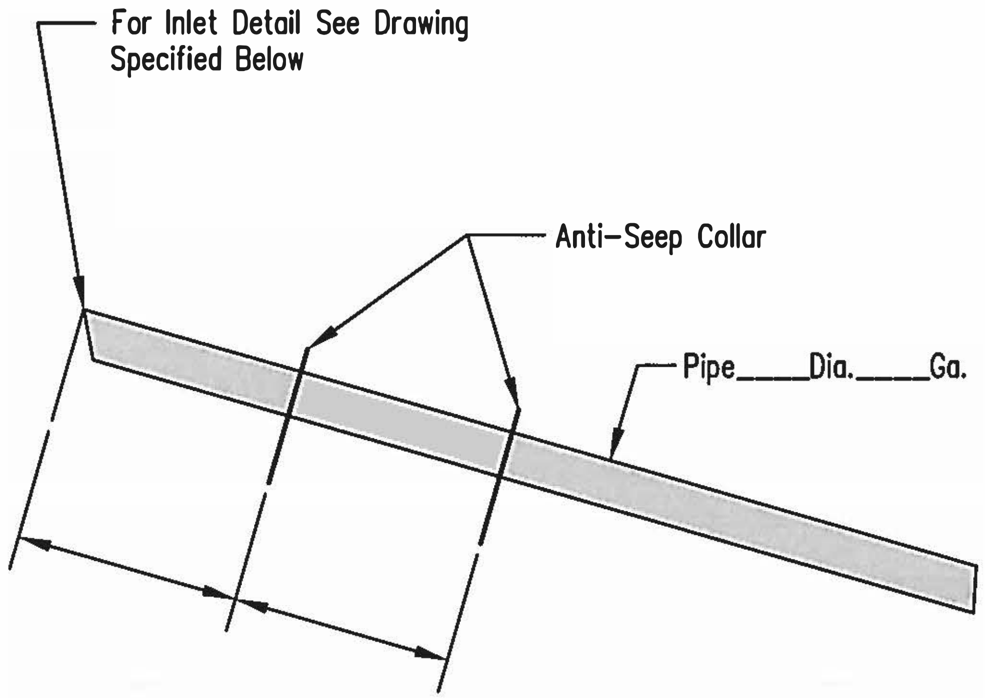


MATERIALS NEEDED FOR PIPE INSTALLATION

Pipe Material: CMP ( ) Steel ( ) Aluminum ( ) Other__________( )
Coating Type: Galvanized ( ) Aluminized ( ) Polymer Coated ( )
Seam Type: Helical ( ) Annular, Caulked & Close Riveted ( )
Corrugations: 2⅔"x 1/2" ( ) 3"x 1" ( ) Other_____ ( )

1. Pipe: _____ft._____dia._____ga
2. Connecting Bands:
   _____each watertight flanges, welded to ends of pipe and bolted together.
   _____each watertight___corrugations wide ___ga. with 4 rods and lugs per band.
   Galvanized ( ) Aluminized ( ) Polymer coated ( ) Welded Joints ( ) Aluminum ( )
3. Diaphragms: Galvanized ( ) Steel ( ) Aluminum ( ) Polymer Coated ( )
   ___each, _____' x_____', _____ga. or _____" thick.
4. Asphalt Mastic with Fibers Reinforced, ______gal.
5. Structural Steel

Trash Rack	Guard Rail
(1) Rectangular Type_______lbs.	(1) Pipe ________lin. ft.
(2) Conical Type.__________lbs.	(2) Angle Iron _______lbs.

6. Concrete required: Yes ( ) No ( ) _____ cubic yards
7. Pipe Support: Yes ( ) No ( )

Construction and Material Specifications:

____

____

____

____

Notes: ____________________________________

____

____

____

____

Referenced Standard Drawings

- ☐ Hood Inlet
  Dwg No.________
- ☐ Trash Rock
  Dwg No.________
- ☐ Pipe Support
  Dwg No.________
- ☐ Anti-Seep Collar
  Dwg No.________
- ☐ Appurtenances
  Dwg No.________

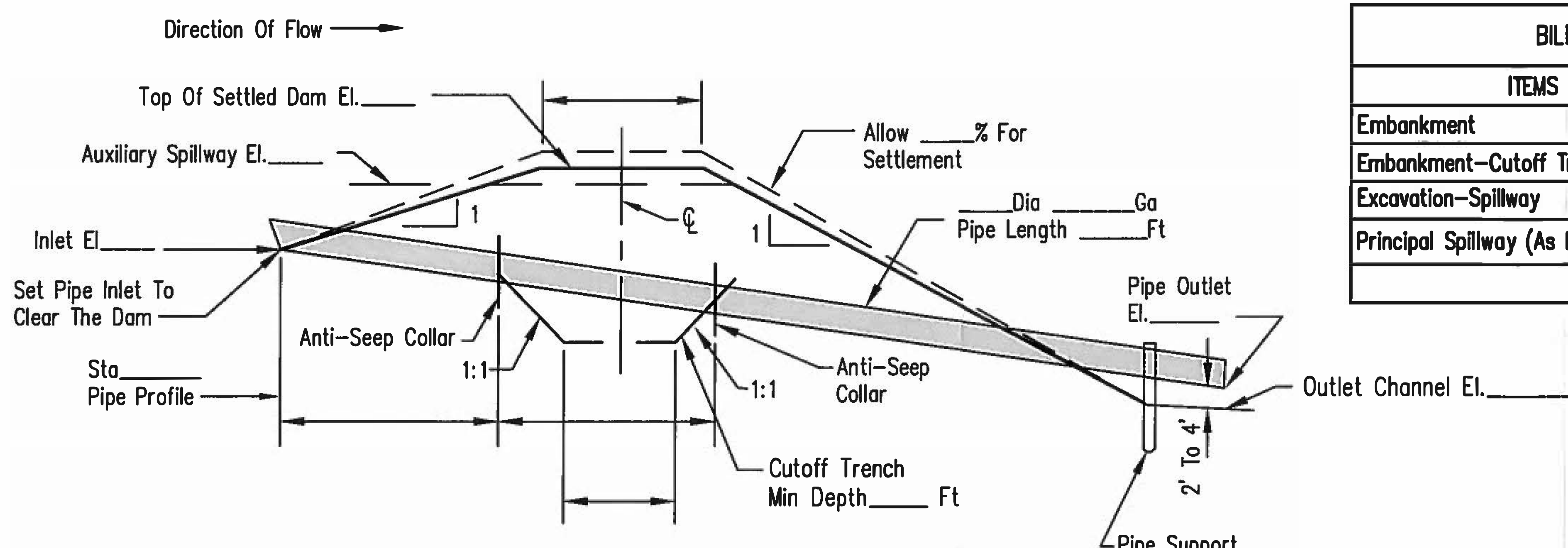
Landowner		Location	

Date 2/16
Designed
Drawn M. QUINONES
Checked
Approved

PLAN FOR EARTH DAM WITH HOOD INLET PRINCIPAL SPILLWAY

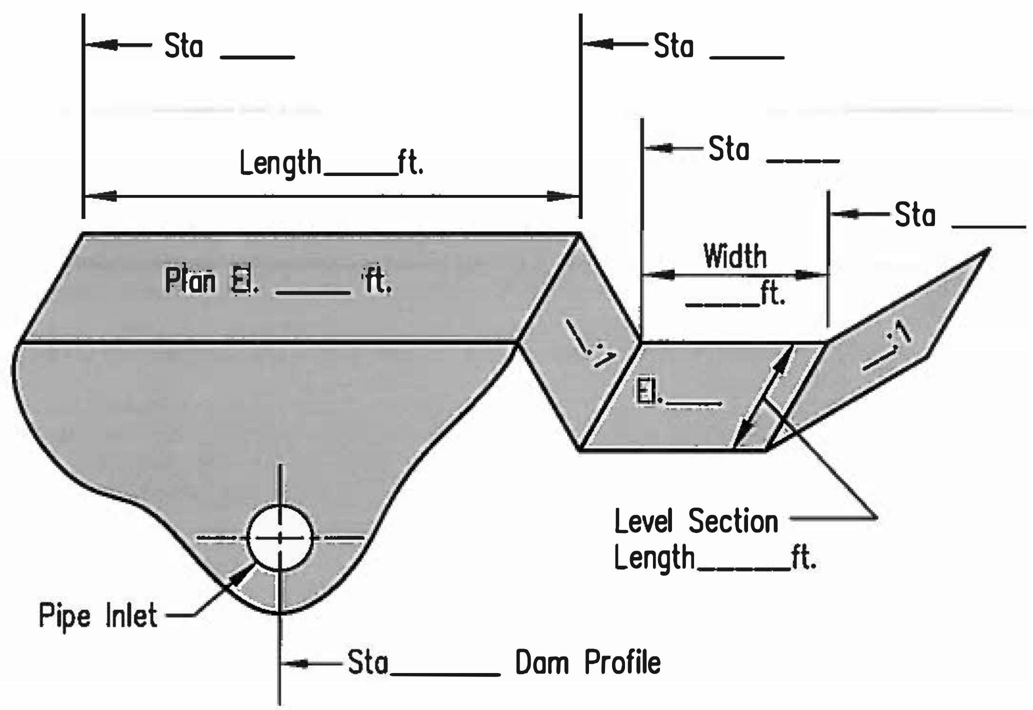
USDA United States Department of Agriculture
Natural Resources Conservation Service

File No. IL-ENG-42
Drawing Set
Page 2 of 2
Sheet of

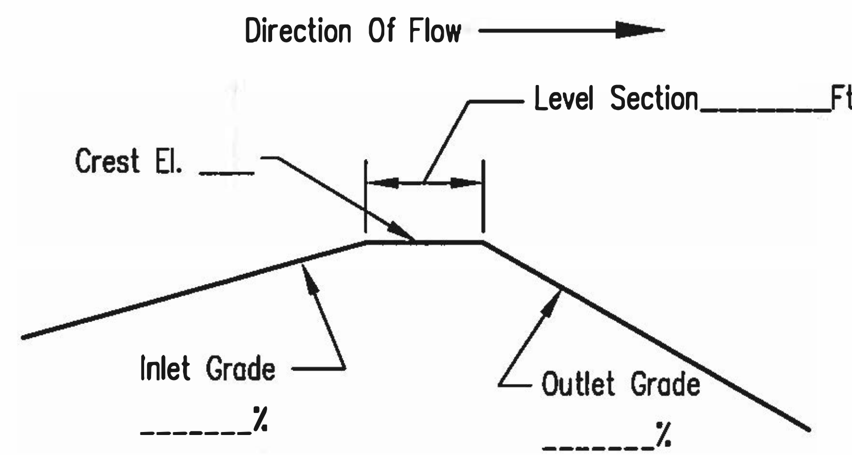


SECTION ALONG CENTERLINE OF PIPE SPILLWAY

BILL OF MATERIALS		
ITEMS	UNIT	QUANTITY
Embankment	Cu.Yd.	
Embankment-Cutoff Trench	Cu.Yd.	
Excavation-Spillway	Cu.Yd.	
Principal Spillway (As Per Detail)	Each	

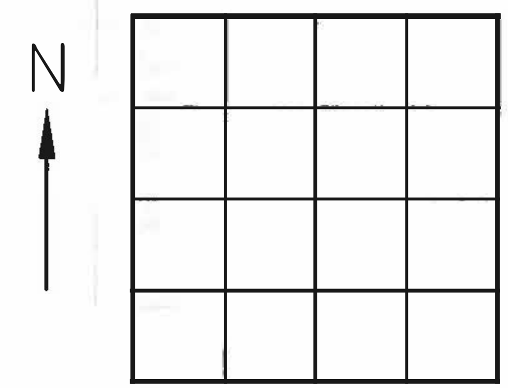


SKETCH OF DAM



PROFILE ON CENTERLINE OF AUXILIARY SPILLWAY

LOCATION OF MAP



Sec.____, T____, R____
B.M. Elevation ________
B.M. Description ________
____

Designed ____ Drawn M. QUINONES Checked ____ Approved ____ Date 2/16

PLAN FOR EARTH DAM WITH HOOD INLET PRINCIPAL SPILLWAY

United States Department of Agriculture
USDA Natural Resources Conservation Service

File No. IL-ENG-42
Drawing Set
Page 1 of 2
Sheet of

Landowner		Location	

Not To Scale