SILVER LAKE - KOSCIUSKO COUNTY, IN OUTLET STRUCTURE IMPROVEMENTS SILVER LAKE, INDIANA 46982 IDNR Project Number: ENG2506320276

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performed an engineering evaluation and design for the proposed improvements. PSI has authored a geotechnical report dated January 23, 2023. Additional commentary and recommendations have been included in this report and should be incorporated into these drawings.

Field conditions may vary from those used as the basis of this design and can change due to construction activities, weather, or other conditions. Therefore, the undersigned Design engineer must be involved during the construction of this project to provide commentary and modifications to the design, if warranted, based on the actual subsurface conditions encountered. Construction means and methods shall be the responsibility of the the contractor.



Christopher Carson, P.E. Chief Engineer IN PE Number: PE10606019 Expires: 07/31/2026

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PRIMARY ACCESS ROUTE72 hour advance notice to owner is required for site access.West Access:Access to dam from County Road S 450 W.Use first driveway north of SR 14. Follow pathway shown on

drawing around pond to existing access road.



ALTERNATE ACCESS ROUTE 72 hour advance notice to owner is required for site access. East Access:

Access to dam from State Road 14. Turn north on Bouse Drive and proceed approximately 0.4 miles to a 'Y'. Follow the left fork to the west. Continue to pasture gate on left (west) side. Ensure gate is closed after entry to pasture. Follow pathway shown on drawing to construction site. Gate Access: – Must coordinate with owner to access pasture.



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PROJECT NO: DATE: DRAWN BY:			0016 01/08/	2025 CC		
CHECKED BY: PROJECT MAN	IAGER:			JG CC		
SILVER LAKE - KOSCIUSKO COUNTY, IN	Outlet Structure Improvements	Silver Lake, Indiana 46982	IDNR PROJECT NUMBER: ENG2506320276			
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REV D	SSUE / RE	IVISIONS:	DAT	E		
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ACCESS PLAN						
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DATE STARTED: 9/7/22						9/7/22	DRILL COMPANY: PSI, Inc.				BORING B-01				
	DATE COMPLETED: 9/7/22					<u>9/7/22</u> 40.0 ft	DRILLER: JC LO	JGGED BY	' <u> </u>		7	⁷ While	e Drillin	g	12.5 feet
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ELEV		l: _			86	63 ft	SAMPLING METHOD:	SS/ S	STSST		$ \mathbf{S} \bar{\mathbf{A}}$	Delay	/		5
LATI	TUDE:				41.0	791°	HAMMER TYPE:	Automa	atic		BORING	LOCA1	FION:		
LONG	GITUDE	≌			-85.	9089°		N/A			West Er	nd			
STAT		Ν	I/A		OFFS	SET: <u>N/A</u>	REVIEWED BY:				Dam Br	dge			
REIVIA	AKKS:								â						
Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATE	RIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS Push Pressure (ST)	Moisture, %		DARD PE TEST [N in blow floisture 25 25 5 5 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7	DATA vs/ft @ • TH, tsf	PL LL 50 Qp 4.0	Additional Remarks
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Intertek Protessional Se						Professiona	i Service Industries, Inc 78th Street	-	P	ROJE	CT NO.: 001		001615	010 Dam	
			(a)a)	2.39		Indianapolis	. IN 46268			OCAT	Silver Lake Dam FION: \$\$ 450 W and \$\$ 14				
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The stratification lines represent approximate boundaries. The transition may be gradual.

Sheet 1 of 1

Siver Lake Dam







STANDARD PENETRATION TEST Driving 2" O.D. Sampler 1'-6" with 140# Hammer falling 30". Count made at 6" intervals. First 6" for seating sampler. "N" is the Sum of the Hammer Blows of the Second and Third 6" intervals of an 1'-6" Drive.

NOTES:

The entire Geotechnical Report developed by Intertek PSI, dated January 23, 2023 is part of the project documents and should be consulted for specific recommendations.







DRAWINGS SHOWN ON THIS SHEET ARE FROM THE DESIGN OF THE ORIGINAL FAILED STRUCTURE. ELEVATIONS ARE BASED ON THE ORIGINAL DESIGN AND SHOWN IN NGVD29 DATUM. ESTABLISHED LAKE LEVEL SHOWN WAS PRIOR TO REESTABLISHMENT IN 2021. THE PRESENT COURT ESTABLISHED LEVEL IS 861.0 FT NGVD 1929 OR 860.6 NAVD 1988; SEE REPORT DATED MARCH 4, 2021 AND VIEWERS REPORT, CAUSE NO .: 43C01-1902-MI-000029.

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SILVER LAKE - KOSCIUSKO COUNTY, IN		Silver Lake, Indiana 46982	IDNR PROJECT NUMBER: ENG2506320276	JG CC
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<u>GENERAL NOTES</u> INTERLOCKING STEEL SEESTING TO BE OF THE TYPE MANUFACTURED BY ARMED DEAIDAGE & METAL PRODUCTS, NA MIDDLETPWN, OHIO OR AN APPROVED EQUAL.

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A MARE & GROUND ELEVATION'S ARE APPROXIMATE ONLY. CONSTRUCTION ELEVATIONS TO BE TAKEN FROM THE SILVER LAKE GAUGE WHICH HAS ZERO (000) SET AT ELEV. BGO DO MEAN SEA LEVEL (M.SL.). ALL DIMENISIONS GIVEN TO & OF INTERLOCK UNLESS OTHERWISE SHOWN.

SITE PLAN NOTES:

FOR ADDITIONAL INFORMATION. FILL ANNULAR SPACE CREATED BETWEEN SHEET PILE WALLS, AFTER INSTALLATION OF NEW WALL. CLASS B CONCRETE WITH TROWEL FINISH SHOULD BE USED AS FILL. (SEE SECTION 1.2.4 ON SHEET 4.0)

AREA FROM PREVIOUS CONSTRUCTION. BOULDERS MAY NEED TO BE STOCKPILED AND REUSED AFTER NEW SHEET PILE IS INSTALLED. BOULDER FILL SHOULD BE REPLACED PRIOR TO PLACEMENT OF NEW ROCK FILL.

3. EXISTING FARM BRIDGE. IF NEEDED, CONTRACTOR IS RESPONSIBLE FOR DETERMINING CAPACITY OF EXISTING BRIDGE AND SECURING PERMISSION TO ACCESS BRIDGE. THE OWNER MAKES NO WARRANTY REGARDING THE USABILITY OF THE EXISTING BRIDGE. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING BRIDGE.

CONSTRUCTION. ONCE SHEET PILING INSTALLATION IS COMPLETE, THE GAUGE AND ELECTRICAL CONNECTION SHALL BE

5. WATER FLOW MUST BE MAINTAINED DURING CONSTRUCTION. NO ADDITIONAL FLOW SHALL BE PERMITTED DURING CONSTRUCTION.

6. CONTRACTOR SHALL CONTACT INDIANA DNR REPRESENTATIVE AT LEAST 72 HOURS PRIOR TO INSTALLING SHEET PILING. 7. EQUIPMENT SHALL NOT BE TRACKED THROUGH WATER. DAMAGE TO THE GROUND SURFACE CAUSED BY CONSTRUCTION EQUIPMENT SHALL BE RESTORED TO ORIGINAL CONDITION PRIOR TO SUBSTANTIAL PROJECT COMPLETION.

8. TOPOGRAPHIC INFORMATION ON THIS SHEET IS BASED ON 1988 VERTICAL DATUM.

10. PROVIDE AS-BUILT PLANS BY PROFESSIONAL LAND SURVEYOR (PLS) LICENSED IN THE STATE OF INDIANA. PLANS SHALL



0+35	0+40	0+45	0+50	0+55	0+60	

SPECIFICATIONS

1. EARTH RETAINING STRUCTURES

1.1. DESCRIPTION

This work shall consist of furnishing and installing earth-retaining systems in accordance with the contract documents and these specifications.

1.2. MATERIALS

1.2.1. Drainage Elements

1.2.1.1. Filter Fabric

Filter fabric shall conform to Section 918 of the Indiana Department of Transportation (INDOT) Standard Specifications.

Permeable Material 1.2.1.2.

Permeable material shall conform to INDOT No. 8 crushed limestone, unless otherwise specified in the contract documents or on the approved working drawings.

1.2.2. Structure Backfill Material

1.2.2.1. General

All structure backfill material shall consist of material free from organic material or other unsuitable material as determined by the Engineer. See INDOT Standard Specification 914.05. Grading shall be as follows, unless otherwise specified.

Sieve Size	Percent Passing				
3.0 in. (75 mm)	100				
No. 4 (4.75 mm)	35-100				
No. 30 (600 μm)	20-100				
No. 200 (75 µm)	0-15				

1.2.3 Steel Sheet Piiling

1.2.3.1 General

This work consists of furnishing and driving corrugated steel sheeting or steel sheet piling in accordance with these specifications and in conformity to the lines and grades shown on the plans or established.

1.2.3.2 Materials

Steel sheet piles shall be of the type and weight (mass) specified in the contract documents. Steel sheet piling shall be in accordance with ASTM A328, ASTM A1011, or ASTM A653. The sides for each piece of sheeting shall be furnished with an interlock that is continuous for the full length of the sheeting. The interlock shall have an opening of sufficient width to allow free slippage of the adjoining sheet. Sheet section sizes are shown on the plan sheet (PZ22 or approved equal).

1.2.3.3 Construction

This work shall consist of constructing continuous walls of steel sheet piles. Steel sheet piling shall be driven to form a tight bulkhead. A driving head shall be used and any piling which does not provide a tight bulkhead shall be pulled and replaced at the Contractor's expense.

Sheet piles shall be driven to the specified penetration. After driving, the tops of sheet piles shall be neatly cut off to a straight line at the elevation specified in the contract documents or as directed by the Engineer.

Steel sheet piling that is full length as shown on the plans and is required to be driven below the specified cut-off elevation shall be spliced with additional steel sheet piling with a full penetration butt weld. Splicing will be limited to one per pile sheet. A splice shall not be within 5 feet of the top of sheet elevation.

Welding shall conform to the applicable requirements of ANSI/AWS D 1.1.

1.2.4 Concrete

1.2.4.1 General

This work consists of furnishing and placing Portland cement concrete for construction of the new retaining structure (fill between old and new sheet piles).

1.2.4.2 Materials

Portland Cement Concrete shall be Class B in general accordance with 2022 INDOT Standard Specification Section 702.02. The material shall be provided according to ISS Section 702.09.

1.2.4.3 Construction

Concrete shall be placed in accordance with ISS Section 702.20. Concrete can be trowel finished after placement reaches the top of the sheet pile wall. No other finishing is required.

1.3. EARTHWORK

1.3.1. Structure Excavation

Structure excavation for earth-retaining systems shall conform to the requirements of 1.4.3, "Structure Excavation and Backfill,", the geotechnical report, and as provided below.

2. SLOPE PROTECTION

This work shall consist of the construction of bank and slope protection courses in accordance with these specifications and in reasonably close conformity with the lines, grades, and thicknesses shown in the contract documents or established by the Engineer. These provisions shall apply to riprap, concrete slope paving, and precast concrete slope paving.

2.1—MATERIALS

2.1.1—Aggregate

Aggregate for riprap shall conform to the requirements of the INDOT Standard Specification Section 904.04. The size shall be consistent with Revetment as detailed in Section 904.04 (f). 2.2 CONSTRUCTION

2.2.1—Preparation of Slopes Where required, slopes shall be shaped to allow the full thickness of the specified slope protection and any bedding or filter gravel. Slopes shall not be steeper than the natural angle of repose of the slope specified in the contract documents.

2.2.2 Hand-Placing Stones

Where hand-placing of stones is specified in the contract documents, the larger stones shall be placed first with close joints in the footing trench. Stones shall be placed with their longitudinal axis normal to the embankment face and arranged so that each stone above the foundation course has a three-point bearing on the underlying stones. Bearing on smaller stones that may be used for chinking voids shall not be acceptable. Placing of stones by dumping shall not be permitted. Interstices shall be filled with smaller stones and spalls.

2.2.3 Machine-Placed Stones

2.2.3.1 Dry Placement

Machine-placed stones shall be so placed so as to provide a minimum of voids, and the larger stones shall be placed in the toe course and on the outside surface of the slope protection. The stone may be placed by dumping and may be spread in layers by bulldozers or other suitable equipment. At the completion of slope protection work, the footing trench shall be filled with excavated material, and compaction will not be required.

2.2.3.2—Underwater Placement

When placed under water, free dumping shall not be permitted without written permission of the Engineer. Placement shall be by controlled methods using bottom dump buckets or wire rope baskets lowered through the water to the point of placement.

3. SEEDING AND SODDING

3.1 DESCRIPTION

This work shall consist of either or both plain and mulched seeding or placing approved sod. It includes furnishing and placing seed, fertilizer, inoculants, top soil, and mulch, if required, in a prepared seed bed or furnishing and placing sod at locations not surficially covered with raprap. Work shall conform to any approved permits included in the project documents. A 9-month inspection will be performed prior to the end of the warranty period. Contractor must return to make necessary repairs prior to the end of the warranty period.

3.2 MATERIAL

Materials shall be in accordance with the following INDOT Standard Specifications:

Fertilizer	914.03
Grass Seed	914.04 and seed mix described herin
Mulch	914.05(a)
Top Soil	914.01
Water	914.09(a)
Staples	914.09(f)

3.3 PREPARATION OF GROUND BEFORE SEEDING

The area to be seeded shall be made smooth and uniform and shall be in accordance with the finished grade and cross section shown on the plans or as otherwise designated and shall be trimmed in accordance with 210.

The seed bed, if not loose, shall be loosened to a minimum depth of 3 in. before fertilizer or seed is applied. Areas to be covered with topsoil shall be milled or disked slightly before the topsoil is placed. A disk, spike-toothed harrow, or other similar device may be used for this purpose. Such loosening will be required to ensure bond of the topsoil with the surface on which it is put and to form a uniform surface. The topsoil shall then be spread to a sufficient depth to produce the thickness specified after it has been compacted lightly with an approved roller, tamping device, or other method.

3.4 PREPARATION OF GROUND BEFORE APPLYING EROSION CONTROL BLANKETS

Prior to placing the blankets, the area to be covered shall be relatively free of all rocks or clods over 1 1/2 in. in diameter, and all sticks or other foreign material, which prevent the close contact of the blanket with the seed bed. If as a result of a rain, prepared seed bed becomes crusted or eroded, or if eroded places, ruts, or depressions exist, the soil shall be reworked until it is smooth. Such areas which are reworked shall be re-seeded. Only "net-free" Curlex, or approved equal, erosion blankets may be used.

3.5 APPLYING FERTILIZER, SEED, AND MULCH

a. Seed

Seed may be drilled in or mixed with water. The mixture shall be sprayed over the area to be seeded. An approved mechanical method which shall place the seed in direct contact with the soil may be used. In places inaccessible to mechanical equipment, or where the area to be seeded is small, a hand operated cyclone seeder or other approved equipment may be used. Seed of warm season grasses, forbs, or aquatic species shall not be covered more than 1/8 in. All other seed shall not be covered more than 1/2 in.

Leguminous seeds, unless otherwise specified, shall be inoculated with a culture in accordance with 914.06. The culture shall be mixed with sufficient water to distribute it thoroughly. The seed shall be wetted thoroughly with the solution and allowed to dry sufficiently to be in condition for sowing. Inoculated seed shall be sown within 30 h after treatment. Where seeding is to be done by hydraulic methods, the 70 inoculate may be added to the water in the spray tank.

b. Wood Cellulose Fiber Mulch

Wood cellulose fiber may be used where mulched seeding is specified. Wood cellulose fiber mulch shall be placed at the rate of 1 ton/ac within 24 h after seeding operations have been completed. Application shall be by hydraulic mulching and consist of mixing wood cellulose fiber mulch and grass seed with water. It shall be mixed in standard hydraulic mulching equipment to form a homogeneous slurry. The slurry shall be sprayed, under pressure, uniformly over the soil surface. The hydraulic mulching equipment shall contain a continuous agitation system that keeps all materials in uniform suspension throughout the mixing and distribution cycles. Fertilizer shall be applied in accordance with 621.05(a).

3.6 SEED MIXTURES

Seed mixtures are classified as follows.

(a) Emergent Wetland Mix

This seed mixture shall be used for disturbed shallow water areas. The seed mix is available from Spence Nursery, or approved equal. The seed shall be placed at the rate directed by the supplier.

(b) Soil Stabilization Mix

This seed mixture is to be placed to restore all other disturbed areas. The seed mix is available from Spence Nursery, or approved equal. The seed shall be placed at the rate directed by the supplier.

3.7 SEEDING OR SODDING DISTURBED AREAS OUTSIDE CONSTRUCTION LIMITS

Areas outside shown construction limits which are disturbed by the Contractor shall be repaired to their original condition or better as soon as possible upon completion. The areas shall be seeded with a seed mixture of turf grasses (low-endophyte, friendly endophyte and endophyte free tall fescue are acceptable, but all other varities of tall fescue are excluded) as directed. If the contract contains seed mixtures other than the two listed here, the Contractor may seed the disturbed area with the mixture contained in the contract provided the area is less than 1 ac in size. If the area disturbed is well maintained and part of a residential or commercial lot, it shall be sodded unless the Engineer determines otherwise.

4.0 EROSION AND SEDIMENT CONTROL

No offsite discharge of sediment reentering the waterway will be allowed. Low flow conditions are typical from August through November with periods of no water flow over dam.

Silt fence, turbidity curtains, and mulch socks are acceptable as suitable methods for erosion and sediment controls. Contractor is responsible for proper installation and maintenance of erosion control elements.

Staged construction is permitted. An Erosion and Settlement Control submittal is required. Submittal must be provided a minimum of 10 days prior to mobilization.

