BLAIR COUNTY CONSERVATION DISTRICT

www.blairconservationdistrict.org

1407 Blair Street • Hollidaysburg, PA 16648 • (814) 696-0877 Ext. 5 • Fax (814) 696-9981

April 24, 2026

Dear Contractor,

This letter is to inform you that the Blair County Conservation District is inviting bids for a Roofed Heavy Use Area project to be done in the Claysburg area of Blair County. Enclosed is the information and designs needed to bid the projects. There will me a mandatory sit showing on May 26, 2026 at 10:00 AM at the construction site. A list of what is involved in the project is enclosed in the bidding information. Please return both the Bid sheet BCCD-18 (Section I, II, and III). **Itemized bids as asked for on the BCCD-18 and attachment are required.** **Please Note: this project requires that PA Prevailing Wage to be paid.** A copy of the prevailing Wage rates is included in the bid package. The Selected contractor will be required to sign the Contractor-Landowner Agreement BCCD-8. The project is divided into 3 separate Phases/bids. One for Excavation, one for Concrete work and one for the Building. You may bid on 1, 2 or all three phases. Bids are due to the Conservation District office by 3:00 PM June 10, 2026. Payment will be made in Lump Sum after project is certified.

If you have any questions, feel free to give me a call at (814) 696-0877 ext. 5. Thanks for your cooperation.

Sincerely,

Richard A. Huether
Agriculture Conservation Specialist

Blair County Conservation District Cost Share Program

Blair County Conservation District
March 2026

DESIGN PACKAGE

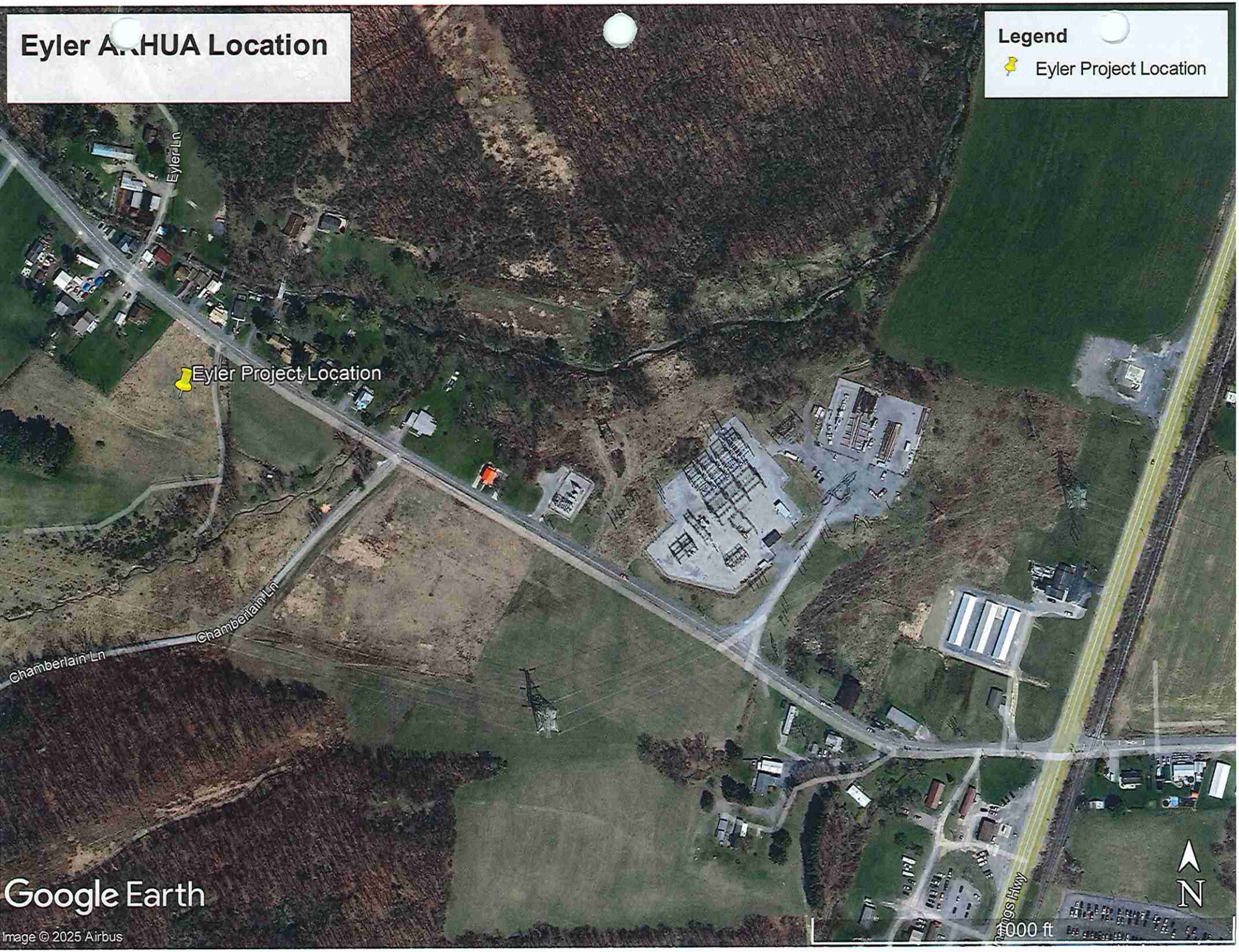
Deloris Eyler

Roofed Heavy Use Area

Blair County, Pennsylvania

C. BIDDING INFORMATION

Eyler Farm Location


Eyler A.RHUA Location
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Announcement – Invitation to Bid

Eyler Animal Roofed Heavy Use Area

The Blair County Conservation District (BCCD) at 1407 Blair Street Hollidaysburg, Pennsylvania is accepting bids to construct the Eyler Animal Roofed Heavy Use Area Project located in Greenfield Twp, Blair County, Pennsylvania. This is a request for qualified contractors to provide a full project bid on constructing phases of this Animal Roofed heavy Use Area in the Fall of 2026.

COVER SHEET

PROJECT DETAILS:

Eyler Animal Roofed Heavy Use Area Project is located at:

Polecat Road, East Freedom PA. Site is on South side of Polecat Road, approximately 500 Feet West of the intersection of Polecat Rd and Chamberland LN, East Freedom. The Coordinates are: 40 18' 52.55" -78 21' 17.73" (DMS).

Site Showing:

A mandatory site showing will be conducted on May 26, 2026 at the construction site listed above.

Work Performance Timeframe:

The Project is scheduled to be done this Summer/Fall, with a completion date of November 30, 2026.

Brief description of work includes:

This project consists of the excavation and installation of an Animal Roofed Heavy Use Area with manure stacking. A new well is also included in the project.

There are 3 Phases/bids for the Project. The first will be for the Excavation portion of the project. The second is for the Concrete work for the project. The third is for the construction of the building on top of the concrete walls. Contractors can bid on 1, 2 or all three phases of the project. Contracts for each phase will be awarded independently of the awards for other phases. The included items for each phase is included on the Bid sheets.

Bids can be Hand Delivered or Mailed to:

Rich Huether
Blair County Conservation District
1407 Blair Street
Hollidaysburg, PA 16648
ATTN: Eyler ARHUA – BID

Bids must be in a sealed envelope including the original itemized bid sheet and received before 3:00 PM June 10, 2026.

The Bid Opening will take place at the Blair County Conservation District office at 3:00 PM June 10, 2026. Delivery of the bid package must be received prior to this time, or the package is invalidated.

Bids will be accepted for review and awarded or rejected at the Board Meeting of the Blair County Conservation District on June 15, 2026 at 7:30 PM local time at the same location.

Proposal Submittal Details

Proposal Requirements:

Please submit your bid using the included bid sheets from the bid Package. Be sure to itemize your bid as listed on the bid sheets. Failure to itemize your bid can result in your bid being determined incomplete. Please include an estimated start date on the bid sheets.

Evaluation and Selection:

Proposals will be evaluated by the staff of BCCD and its designees and reserves the right to designate secondary contractors and award work at its discretion. BCCD reserves the right to postpone or cancel receipt of bids, and to accept or to reject any and all bids in the whole or in part if the best interest of the BCCD will be served thereby.

Submittal of Proposal:

Proposals will be received by Hand Delivery or Mailed Envelope before 3:00 PM, June 10, 2026

Address to:

Rich Huether
Blair County Conservation District
1407 Blair Street
Hollidaysburg, PA 16648
ATTN: Eyler ARHUA – BID

Bid Opening:

The Bid Opening will take place at the Blair County Conservation District Office at 3:00 PM, June 10, 2026.

General Requirements

1.CONTRACTOR'S REPRESENTATIONS: The contractor, by making a Bid, represents that (a) the contractor has read and understands the proposal documents, terms and conditions, and the bid is made in accordance therewith; and (b) the bid is based upon the materials, equipment, systems, or services specified.

2.SUBMISSION OF PROPOSALS: The bid and other documents required to be submitted with the proposal shall be received via Hand Delivery or Mailed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the proposals and shall be identified as a "Sealed Proposal." Proposals shall be delivered and deposited at the designated location prior to the time and date of receipt of proposals. Proposals received after the time and the date for the proposal opening will be returned unopened. The vendor shall assume full responsibility for timely delivery at the location designated for receipt of proposals.

3.MODIFICATION OR WITHDRAWL OF PROPOSALS: Prior to the time and date designated for receipt of proposals, a proposal submitted may be modified or withdrawn by notice to the party receiving proposals at the place designated for receipt of proposals. Such notice shall be in writing over the signature of the vendor and shall be received prior to the designated time and date for receipt of proposals. A modification shall be worded so as not to reveal the amount of the original proposal.

4.OPENING OF PROPOSALS: Bids shall be opened by BCCD shortly after the time and date proposals are due.

5.REJECTION OF PROPOSALS: BCCD shall have the right to reject any and all bids, in whole or part; and to reject proposals not accompanied by data required by the bid documents; or to reject a bid which is in any way incomplete or irregular.

6.ACCEPTANCE OF PROPOSAL (AWARD): It is the intent of BCCD to award a contract to the contractor who can demonstrate the necessary experience to complete the scope of work. BCCD shall have the right to waive informalities or irregularities in a bid received and to accept the bid, which in the BCCD's judgment, is in the BCCD's own interests.

7.TAX EXEMPTION: The Blair County Conservation District is exempt from federal and state taxes and will not pay or reimburse such taxes.

8.PREVAILING WAGE: Successful bidders for the Ritchey Property Streambank Stabilization Project will be required to comply with the PA Department of Labor and Industry, Prevailing Minimum Wage (Act422 of 1961, P.L.987 amended).

9.PAYMENT: Upon satisfactory completion of each project, a lump sum payment shall be made within 30 days of receipt of an invoice with copies of certified payroll.

- A Certificate of Conformance from the bid package must be signed by the Contractor and all sub-contractors to verify that All Work is completed after the job site is finished.

10.INSURANCE: Before the issuance of a contract, and before commencing any work, the vendor shall furnish a certificate, satisfactory to BCCD, from each insurance company showing that the above insurance is in force, stating policy numbers, dates of expiration, and limits of liability thereunder, and further providing that the insurance will not be cancelled or changed until the expiration of at least thirty (30) days after written notice of such cancellation. The Blair County Conservation District must be listed as an "Additional Insured" on all policies.

INSURANCE: Vendor shall furnish proof of coverage of Commercial General Liability Insurance. The minimum amount of insurance coverage required is $1,000,000.

COMPREHENSIVE AUTOMOBILE LIABILITY INSURANCE: Vendor shall furnish proof of Comprehensive Automobile Liability Insurance covering all owned, non-owned, and hired automobiles used in connection with the services agreed upon in this contract. The minimum amount of coverage required is $1,000,000.

WORKMAN'S COMPENSATION INSURANCE: Per Pennsylvania statutory limits.

11.MISCELLANEOUS: Discussions and interviews may be held with contractors under final consideration prior to selection for award; however, proposals may be accepted without such discussions or interviews. In the event that mutually acceptable terms cannot be reached within a reasonable period of time, BCCD reserves the right to undertake negotiations with the next most advantageous vendor without undertaking a new procurement process.

12.SIGNING OF CONTRACT: The contract MUST be signed and returned to BCCD along with insurance documentation before any transactions take place. Otherwise, the contract will be awarded to the next lowest responsible vendor.

- Before signing the contract, we require the following documents to be completed, signed, and submitted:
    1. Certificate of Insurance (see attached detail – Article 6 – Bonds and Insurance)

13. Any modifications of the work that would modify the contract must be discussed and approved by BCCD Staff, Larson Design Group (Engineer of Record) and documented in a Change Order Form.

BLAIR COUNTY CONSERVATION DISTRICT FINANCIAL ASSISTANCE FUNDING PROGRAM
BID SHEET
SECTION I

Landowner: Deloris Eyler

Project Location:
Polecat Rd.
East Freedom, PA 16637
40 18' 52.55" -78 21' 17.73"

Project Description:
Excavation Bid - Animal Roofed Heavy Use Area
Incuding Excavation, Well, Roof Gutters

Site Showing
Date: May 26, 2026
Time: 10:00 AM
Meeting Place: Construction Site

Bid Opening
Date: June 10, 2026
Time: 3:00 PM
Location: Blair County Conservation District
1407 Blair Street Hollidaysburg, PA 16648

Attached Plans:
Dated: March 2026
Pages 1 – G001-S401

Attached Specifications:
313,367,561,342,362,382,468,516,533,558,560,606,614,620,642

Referenced Specifications:
313,367,561,342,362,382,468,516,533,558,560,606,614,620,642

Section II

(To be Completed by District)			(To be Completed by Bidder)	
ITEM	ESTIMATED QUANTITY	UNITS	UNIT PRICE	PRICE
Excav/Fill Building/Apron/PumpRm	1	Ea		
Critical Area Planting	.5	Ac		
Diversion	172	LF		
16' tubular Gate	1	Ea		
4 Strand HT Fence	460	LF		
Access Rd	3080	SF		
Roof Gutters/downs	268	LF		
Perimeter Drain	300	LF		
4" Sch 40 Underground Outlet	20	LF		
6" Sch 40 Underground Outlet	200	LF		
Rock Lined Outlet	1	EA		
Well - 6"	300	LF		
Well Pump/pressure tank/equipment	1	EA		
Livestock Pipeline 1"	185	LF		
Watering Facility	1	EA		
E&S Contols	1	EA		
Estimated Start Date:			TOTAL PRICE	$

This bid is submitted in response to the invitation for bids on the project described above. The bid is based on my knowledge of the plans and specifications identified above. I acknowledge that I was aware of the opportunity to visit the project site at the site showing listed above. I have read the general provisions of and am willing to sign a Contractor-Landowner Contract (BCCD-8).

COMMENTS: _____

Company: _____ Signature: _____

Address: _____ Title: _____

_____ Date: _____

Telephone: _____ E-mail: _____

BLAIR COUNTY CONSERVATION DISTRICT FINANCIAL ASSISTANCE FUNDING PROGRAM
BID SHEET

SECTION I

Landowner: Deloris Eyler
Project Location:
Polecat Rd.
East Freedom, PA 16637
40 18' 52.55" -78 21' 17.73"
Project Description:
Concrete Work for Animal Roofed Heavy Use Area

Site Showing
Date: May 26, 2026
Time: 10:00 AM
Meeting Place: Construction Site

Bid Opening
Date: June 10, 2026
Time: 3:00 PM
Location: Blair County Conservation District
1407 Blair Street Hollidaysburg, PA 16648

Attached Plans:
Dated: March 2026
Pages 1 – G001-S401

Attached Specifications:
313,367,561,342,362,382,468,516,533,558,560,606,614,620, 642
Referenced Specifications:
313,367,561,342,362,382,468,516,533,558,560,606,614, 620, 642

Section II

(To be Completed by District)			(To be Completed by Bidder)	
ITEM	ESTIMATED QUANTITY	UNITS	UNIT PRICE	PRICE
Building Floor/Pump Room Floor	3,844	SF		
Apron	256	SF		
Roll Curb	16	LF		
2' Wall (Buried under roll Curb)	16	LF		
18" Exposed Wall (3'6" total)	104	LF		
4' Exposed Wall (6' total)	94	LF		
6' Exposed Wall (8' total)	66	LF		
Third Party Concrete Testing	1	Project		
			TOTAL PRICE	$

This bid is submitted in response to the invitation for bids on the project described above. The bid is based on my knowledge of the plans and specifications identified above. I acknowledge that I was aware of the opportunity to visit the project site at the site showing listed above. I have read the general provisions of and am willing to sign a Contractor-Landowner Contract (BCCD-8).

COMMENTS: _____

Company: _____
Address: _____
_____
Telephone: _____

Signature: _____
Title: _____
Date: _____
E-mail: _____

Estimated Start Date: _____

BLAIR COUNTY CONSERVATION DISTRICT FINANCIAL ASSISTANCE FUNDING PROGRAM
BID SHEET

SECTION I

Landowner: Deloris Eyler
Project Location:
Polecat Rd.
East Freedom, PA 16637
40 18' 52.55" -78 21' 17.73"
Project Description:
Building - Animal Roofed Heavy Use Area

Attached Plans:
Dated: March 2026
Pages 1 – G001-S401

Site Showing
Date: May 26, 2026
Time: 10:00 AM
Meeting Place: Construction Site

Bid Opening
Date: June 10, 2026
Time: 3:00 PM
Location: Blair County Conservation District
1407 Blair Street Hollidaysburg, PA 16648

Attached Specifications:
313,367,561,342,362,382,468,516,533,558,560,606,614,620,642
Referenced Specifications:
313,367,561,342,362,382,468,516,533,558,560,606,614,620,642

Section II

(To be Completed by District)			(To be Completed by Bidder)	
ITEM	ESTIMATED QUANTITY	UNITS	UNIT PRICE	PRICE
Building (104x36)	3,744	sf		
Pump Room (10x10)	100	sf		
Woven Wire Fence	264	LF		
			TOTAL PRICE	$

This bid is submitted in response to the invitation for bids on the project described above. The bid is based on my knowledge of the plans and specifications identified above. I acknowledge that I was aware of the opportunity to visit the project site at the site showing listed above. I have read the general provisions of and am willing to sign a Contractor-Landowner Contract (BCCD-8).

COMMENTS:

Company:
Address:
Telephone:
Estimated Start Date:

Signature:
Title:
Date:
E-mail:

BLAIR COUNTY CONSERVATION DISTRICT FINANCIAL ASSISTANCE FUNDING PROGRAM
CONTRACTOR-LANDOWNER CONTRACT (BCCD-8)

Landowner: Deloris Eyler
Address: 129 Eyler Ln
Est Freedom, PA 16637
Telephone: 814-239-5283
Project Location
Polecat Rd
East Freedom, PA 16637

Project Designer
Name: Adam Winey - Larson Design Group
Title: PE

Contractor: _____
Address: _____

Telephone: _____
Attached Plans: Dated January 2025
Pages 1 - _____
Referenced Specifications:

Attached Specs: _____
Certifying Agency: Larson Design Group

This Contract is made this _____ day of _____ by and between
(month) (year)
_____, hereinafter called the "Contractor",
and, Deloreis Eyler, hereinafter called the "Landowner",
to install Roofed Heavy Use Area Project at the Project Location described above, as set forth in the attached Plans and Specifications described above.

The Contractor shall perform all the work in accordance with the above referenced Plans and Specifications and subject to the General Provisions hereinafter listed and Special Provisions that may be hereinafter listed, for the Contract Sum of _____ Dollars ($_____) as detailed on the attached Bid Sheet. The work shall be performed between _____ and _____.
(month,day,year) (month,day,year)

A. GENERAL PROVISIONS

1. By signing this contract the Landowner warrants that he/she is either the sole owner of the real property on which the work is to be performed or is otherwise in fact authorized by the owner or owners of said premises to let the work be done on said premises, and has secured any necessary easements or right-of-way that may be necessary for the completion of the work.

2. Except as otherwise noted, the Contractor shall provide and pay for all material, labor, equipment, tools, water, power, and other items necessary to complete the work.

3. Unless otherwise specified, all materials shall be new, and both workmanship and materials shall be of good quality and all work completed in a workmanlike manner in accordance with the attached or referenced Plans and Specifications.

4. Subcontractors engaged by the Contractor shall be bound by the Plans, Specifications, and Provisions of this contract. The Contractor shall assume responsibility for and compensate all subcontractors. No contract between the Contractor and a subcontractor will be considered a contract between the subcontractor and the Landowner.

5. The Contractor shall during his regular working hours permit observation of the work by the Landowner, his authorized agents, and public authorities who have a bonafide interest in the successful completion of the work.

6. If a unit has been requested on the bid sheet, then the unit price submitted by the contractor shall apply within the ranges of plus or minus 25% of the estimated number of units on the bid sheet. Quantity variations in excess of 25% shall be reflected in a unit price adjustment using General Provision 7 or 8 as appropriate.

7. All disputes arising under or related to this contract shall be resolved under this provision. All claims shall be submitted to the Landowner in writing to document the reason for seeking, as a matter of right, the payment of money in a certain sum, the adjustment or interpretation of contract terms, or other relief. In the event the Landowner and Contractor cannot equitably resolve the dispute it shall be referred to the conservation district for resolution. If the conservation district's decision is not satisfactory to either the Landowner or the Contractor, it may be submitted to the State Conservation Commission for review.

8. The Landowner may order changes in work or additional work to be done due to changed or unforeseen conditions, however, the Contract Sum and performance time shall be adjusted equitably through negotiations. All such orders shall be in the form of Contract Modifications prepared by the conservation district on form BCCD-8M. The Contract Modifications shall specify the amount of compensation to be paid to the Contractor for such work and when such work shall be performed. All Contract Modifications ordering changes in work or additional work shall be based on written technical justifications prepared by the designer identified above and on the Plans. A Contract Modification shall become effective upon the written acceptance of the Landowner and the Contractor. All such Contract Modifications shall become part of this contract and subject to the Plans, Specifications, and Provisions unless otherwise stipulated in the Contract Modification.

9. The Contractor shall re-execute any work that fails to conform to the requirements of this contract and that appears during the progress of the work, and shall remedy any defects due to faulty materials or workmanship which appear within a period of one year from the date of completion of the contract. This provision shall not supersede any warranties on manufactured materials which extend beyond one year.

10. Should the Contractor fail to execute the work in accordance with the contract or fail to make reasonable progress toward completion, the Landowner may, after providing the contractor with at least seven (7) days written notice of such intent, issue a stop work order and terminate the contract. In such case, the Contractor shall be entitled to equitable compensation for that work certified as meeting contract provisions less the cost of removal or correction of faulty or incomplete work and materials and any administrative costs associated with rebidding the project.

11. Should the work be stopped by an act of God or delays beyond the Contractor's control for a period of thirty days or more, then the Contractor may upon seven days written notice stop work or terminate the contract and recover from the Landowner payment for all acceptably executed work and any sustained losses and reasonable actual damages caused by an act of or neglect by the Landowner.

12. The Landowner assigns to the Contractor as security for payment all of his right, title and interest to any funds he may receive pursuant to the Blair County Conservation District Financial Assistance Funding Program and other agricultural cost share programs arising out of this work. The Landowner agrees that he will execute any additional documents necessary to carry out the intent of this provision.

13. Payment of the Contract Sum shall be made to the Contractor within seven days after the Landowner's receipt of agricultural cost share program funds, unless otherwise stated in a Special Provision. The making and acceptance of the Contract Sum payment shall constitute a waiver of all claims by the Landowner, other than those arising from unsettled liens or from faulty work appearing thereafter, as provided for in General Provision 9, and all claims by the Contractor as provided for in General provision 7, except as previously made and still unsettled. Payment otherwise due may be withheld on account of defective work not remedied, liens filed, damage by the Contractor to others not adjusted, or failure to make proper payments to subcontractors or for material or labor.

14. The Landowner and Contractor shall each maintain adequate insurance to protect himself/herself from claims by employees, subcontractors, and other parties which may arise from activities under this contract.

15. The Contractor shall be knowledgeable of and comply with all local, state, and federal health and safety regulations that apply to this type of work. Contractor shall take all reasonable precautions to protect the project work against unauthorized trespass and weather events. Upon official notice by the Contractor, the certifying agency generally has three (3) working days to certify and report all work satisfactorily performed in accordance with the contract to the conservation district.

B. SPECIAL PROVISIONS

There are _____ Special Provisions attached to and incorporated in this contract.
(number)

In witness whereof, the parties hereto have executed this contract.

Landowner(s) Signature(s): _____ Date: _____

Contractor Signature: _____ Date: _____

Title: _____

WEEKLY PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS

☐ Contractor or ☐ Subcontractor (Please check one) **ALL INFORMATION MUST BE COMPLETED**

CONTRACTOR ADDRESS	SUBCONTRACTOR ADDRESS	LABOR & INDUSTRY BUREAU OF LABOR LAW COMPLIANCE PREVAILING WAGE DIVISION 7TH & FORSTER STREETS HARRISBURG PA 17120 1-800-932-0665
PAYROLL NUMBER / WEEK ENDING DATE	PROJECT AND LOCATION PROJECT SERIAL # PROJECT #	

EMPLOYEE NAME	APPR. RATE (%)	WORK CLASSIFICATION	DAY AND DATE / HOURS WORKED EACH DAY	S-TIME 0-TIME	BASE HOURLY RATE	TOTAL FRINGE BENEFITS (C=Cash) (FB=Contributions)*	TOTAL DEDUCTIONS	GROSS PAY FOR PREVAILING RATE JOB(S)	CHECK #
						C: FB:			
						C: FB:			
						C: FB:			
						C: FB:			
						C: FB:			

*SEE REVERSE SIDE

PAGE NUMBER _____ OF _____

THE NOTARIZATION MUST BE COMPLETED ON FIRST AND LAST SUBMISSIONS ONLY. ALL OTHER INFORMATION MUST BE COMPLETED WEEKLY.

*FRINGE BENEFITS EXPLANATION (FB): Bona fide benefits contribution, except those required by Federal or State Law (unemployment tax, workers' compensation, income taxes, etc.)

Please specify the type of benefits provided and contributions per hour:

1) Medical or hospital care _____
2) Pension or retirement _____
3) Life insurance _____
4) Disability _____
5) Vacation, holiday _____
6) Other (please specify) _____

CERTIFIED STATEMENT OF COMPLIANCE

1. The undersigned, having executed a contract with _____
(AWARDING AGENCY, CONTRACTOR OR SUBCONTRACTOR)

_____ for the construction of the above-identified project, acknowledges that:

(a) The prevailing wage requirements and the predetermined rates are included in the aforesaid contract.

(b) Correction of any infractions of the aforesaid conditions is the contractor's or subcontractor's responsibility.

(c) It is the contractor's responsibility to include the Prevailing Wage requirements and the predetermined rates in any subcontract or lower tier subcontract for this project.

2. The undersigned certifies that:
   (a) Neither he nor his firm, nor any firm, corporation or partnership in which he or his firm has an interest is debarred by the Secretary of Labor and Industry pursuant to Section 11(e) of the PA Prevailing Wage Act, Act of August 15, 1961, P.L. 987 as amended, 43 P.S.§ 165-11(e).

   (b) No part of this contract has been or will be subcontracted to any subcontractor if such subcontractor or any firm, corporation or partnership in which such subcontractor has an interest is debarred pursuant to the aforementioned statute.

3. The undersigned certifies that:
   (a) the legal name and the business address of the contractor or subcontractor are: _____
   _____

   (b) The undersigned is: ☐ a single proprietorship ☐ a corporation organized in the state of _____
   ☐ a partnership ☐ other organization (describe) _____

   (c) The name, title and address of the owner, partners or officers of the contractor/subcontractor are:

NAME	TITLE	ADDRESS

The willful falsification of any of the above statements may subject the contractor to civil or criminal prosecution, provided in the PA Prevailing Wage Act of August 15, 1961, P.L. 987, as amended, August 9, 1963, 43 P.S. § 165.1 through 165.17.

_____ (DATE)

_____ (SIGNATURE)

_____ (TITLE)

_____ SEAL

Taken, sworn and subscribed before me this _____ Day of _____ A.D., _____

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project Name:	Eyler Roofed Heavy Use Area
General Description:	Animal Roofed Heavy Use Area with manure stacking.
Project Locality	Polecat Rd East Freedom, PA 16
Awarding Agency:	Blair County Conservation District
Contract Award Date:	5/15/2026
Serial Number:	26-04072
Project Classification:	Building/Heavy/Highway
Determination Date:	4/24/2026
Assigned Field Office:	Altoona
Field Office Phone Number:	(814)940-6224
Toll Free Phone Number:	
Project County:	Blair County

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 26-04072 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Asbestos & Insulation Workers	8/1/2024		$41.55	$29.51	$71.06
Boilermakers	6/1/2016		$40.90	$27.61	$68.51
Bricklayer	6/1/2025		$38.65	$23.52	$62.17
Bricklayer	12/1/2025		$39.15	$24.02	$63.17
Carpenters - Piledriver/Welder	1/1/2025		$43.38	$22.72	$66.10
Carpenters - Piledriver/Welder	1/1/2026		$44.63	$23.47	$68.10
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2025		$34.76	$20.91	$55.67
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2026		$34.76	$23.41	$58.17
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2027		$34.76	$25.66	$60.42
Cement Masons	1/1/2025		$31.97	$21.47	$53.44
Cement Masons	1/1/2026		$32.97	$22.47	$55.44
Drywall Finisher	1/1/2025		$34.01	$24.63	$58.64
Drywall Finisher	6/1/2025		$35.16	$25.98	$61.14
Electricians & Telecommunications Installation Technician	12/27/2024		$50.86	$32.69	$83.55
Electricians & Telecommunications Installation Technician	12/26/2025		$53.11	$33.72	$86.83
Elevator Constructor	1/1/2025		$61.07	$40.05	$101.12
Elevator Constructor	1/1/2026		$63.71	$40.89	$104.60
Glazier	9/1/2024		$26.00	$26.95	$52.95
Glazier	9/1/2025		$28.00	$27.67	$55.67
Iron Workers	6/1/2024		$32.99	$34.30	$67.29
Iron Workers	6/1/2025		$34.76	$34.73	$69.49
Laborers (Class 01 - See notes)	1/1/2025		$28.31	$17.82	$46.13
Laborers (Class 01 - See notes)	1/1/2026		$29.31	$18.82	$48.13
Laborers (Class 01 - See notes)	1/1/2027		$30.31	$19.82	$50.13
Laborers (Class 02 - See notes)	1/1/2025		$30.66	$17.82	$48.48
Laborers (Class 02 - See notes)	1/1/2026		$31.66	$18.82	$50.48
Laborers (Class 02 - See notes)	1/1/2027		$32.66	$19.82	$52.48
Laborers (Class 03 - See notes)	1/1/2025		$31.56	$17.82	$49.38
Laborers (Class 03 - See notes)	1/1/2026		$32.56	$18.82	$51.38
Laborers (Class 03 - See notes)	1/1/2027		$33.56	$19.82	$53.38
Laborers (Class 04 - See notes)	1/1/2025		$27.31	$17.82	$45.13
Laborers (Class 04 - See notes)	1/1/2026		$28.31	$18.82	$47.13
Laborers (Class 04 - See notes)	1/1/2027		$29.31	$19.82	$49.13
Landscape Laborer (Skilled)	1/1/2025		$25.79	$18.78	$44.57
Landscape Laborer (Skilled)	1/1/2026		$26.79	$19.03	$45.82
Landscape Laborer (Tractor Operator)	1/1/2025		$26.09	$18.78	$44.87
Landscape Laborer (Tractor Operator)	1/1/2026		$27.09	$19.03	$46.12
Landscape Laborer	1/1/2025		$25.37	$18.78	$44.15
Landscape Laborer	1/1/2026		$26.37	$19.03	$45.40
Millwright	6/1/2020		$41.68	$20.32	$62.00
Operators (Class 01 - see notes)	7/1/2025		$37.97	$21.82	$59.79

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 26-04072 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Operators (Class 01 - see notes)	7/1/2026		$39.12	$22.17	$61.29
Operators (Class 02 -see notes)	7/1/2025		$33.35	$21.82	$55.17
Operators (Class 02 -see notes)	7/1/2026		$34.50	$22.17	$56.67
Operators (Class 03 - See notes)	7/1/2025		$30.80	$21.82	$52.62
Operators (Class 03 - See notes)	7/1/2026		$31.95	$22.17	$54.12
Operators (Class 04 - Chief of Party (Surveying and Layout))	7/1/2025		$30.40	$21.82	$52.22
Operators (Class 04 - Chief of Party (Surveying and Layout))	7/1/2026		$31.55	$22.17	$53.72
Operators (Class 04 - Instrument Person (Surveying & Layout))	7/1/2025		$29.40	$21.82	$51.22
Operators (Class 04 - Instrument Person (Surveying & Layout))	7/1/2026		$30.55	$22.17	$52.72
Operators (Class 04 - Rodman/Chainman (Surveying and Layout))	7/1/2025		$28.95	$21.82	$50.77
Operators (Class 04 - Rodman/Chainman (Surveying and Layout))	7/1/2026		$30.10	$22.17	$52.27
Painters Class 6 (see notes)	6/1/2024		$32.14	$24.93	$57.07
Painters Class 6 (see notes)	6/1/2025		$34.16	$25.81	$59.97
Pile Driver Divers (Building, Heavy, Highway)	1/1/2025		$62.82	$22.72	$85.54
Pile Driver Divers (Building, Heavy, Highway)	1/1/2026		$64.70	$23.47	$88.17
Piledrivers	1/1/2025		$41.88	$22.72	$64.60
Piledrivers	1/1/2026		$43.13	$23.47	$66.60
Plasterers	6/1/2024		$33.14	$21.04	$54.18
Plumbers and Steamfitters	6/1/2025		$41.47	$27.71	$69.18
Plumbers and Steamfitters	6/1/2026		$42.92	$28.45	$71.37
Pointers, Caulkers, Cleaners	6/1/2025		$40.66	$21.99	$62.65
Pointers, Caulkers, Cleaners	12/1/2025		$41.50	$22.50	$64.00
Roofers	6/1/2025		$39.91	$20.76	$60.67
Roofers	12/1/2025		$41.21	$21.46	$62.67
Sheet Metal Workers	6/1/2024		$43.09	$43.14	$86.23
Sheet Metal Workers	6/1/2025		$45.02	$44.71	$89.73
Sign Makers and Hangars	7/15/2024		$32.32	$25.82	$58.14
Sign Makers and Hangars	7/15/2025		$33.48	$26.41	$59.89
Sprinklerfitters	4/1/2024		$46.45	$28.62	$75.07
Sprinklerfitters	4/1/2025		$49.75	$29.21	$78.96
Sprinklerfitters	4/1/2026		$52.82	$30.56	$83.38
Stone Masons	12/1/2022		$38.56	$23.61	$62.17
Terrazzo Finisher	6/1/2025		$41.73	$19.03	$60.76
Terrazzo Finisher	12/1/2025		$42.75	$19.51	$62.26
Terrazzo Mechanics	6/1/2025		$41.13	$21.28	$62.41
Terrazzo Mechanics	12/1/2025		$42.15	$21.76	$63.91
Tile Finisher	6/1/2025		$33.24	$18.36	$51.60
Tile Finisher	12/1/2025		$33.99	$18.71	$52.70
Tile Setter	6/1/2025		$40.15	$22.80	$62.95
Tile Setter	12/1/2025		$40.80	$23.25	$64.05

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 26-04072 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Truckdriver class 1(see notes)	1/1/2025		$36.43	$23.21	$59.64
Truckdriver class 1(see notes)	1/1/2026		$37.93	$23.71	$61.64
Truckdriver class 2 (see notes)	1/1/2025		$36.89	$23.52	$60.41
Truckdriver class 2 (see notes)	1/1/2026		$38.39	$24.02	$62.41
Window Film / Tint Installer	10/1/2019		$25.00	$2.63	$27.63

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 26-04072 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Carpenter	1/1/2025		$41.10	$22.09	$63.19
Carpenter	1/1/2026		$42.35	$22.84	$65.19
Carpenter Welder	1/1/2025		$42.60	$22.09	$64.69
Carpenter Welder	1/1/2026		$43.85	$22.84	$66.69
Carpenters - Piledriver/Welder	1/1/2025		$43.38	$22.72	$66.10
Carpenters - Piledriver/Welder	1/1/2026		$44.63	$23.47	$68.10
Cement Finishers	1/1/2024		$35.14	$26.30	$61.44
Cement Finishers	1/1/2025		$35.94	$27.50	$63.44
Cement Masons	1/1/2020		$32.84	$21.10	$53.94
Electric Lineman	6/3/2024		$53.97	$31.05	$85.02
Electric Lineman	6/2/2025		$57.10	$31.63	$88.73
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	6/1/2024		$32.99	$34.30	$67.29
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	6/1/2025		$34.76	$34.73	$69.49
Laborers (Class 01 - See notes)	1/1/2025		$33.70	$26.00	$59.70
Laborers (Class 01 - See notes)	1/1/2026		$34.70	$27.00	$61.70
Laborers (Class 02 - See notes)	1/1/2025		$33.86	$26.00	$59.86
Laborers (Class 02 - See notes)	1/1/2026		$34.86	$27.00	$61.86
Laborers (Class 03 - See notes)	1/1/2025		$34.25	$26.00	$60.25
Laborers (Class 03 - See notes)	1/1/2026		$35.25	$27.00	$62.25
Laborers (Class 04 - See notes)	1/1/2025		$34.70	$26.00	$60.70
Laborers (Class 04 - See notes)	1/1/2026		$35.70	$27.00	$62.70
Laborers (Class 05 - See notes)	1/1/2025		$35.11	$26.00	$61.11
Laborers (Class 05 - See notes)	1/1/2026		$36.11	$27.00	$63.11
Laborers (Class 06 - See notes)	1/1/2025		$31.95	$26.00	$57.95
Laborers (Class 06 - See notes)	1/1/2026		$32.95	$27.00	$59.95
Laborers (Class 07 - See notes)	1/1/2025		$34.70	$26.00	$60.70
Laborers (Class 07 - See notes)	1/1/2026		$35.70	$27.00	$62.70
Laborers (Class 08 - See notes)	1/1/2025		$36.20	$26.00	$62.20
Laborers (Class 08 - See notes)	1/1/2026		$37.20	$27.00	$64.20
Millwright	6/1/2024		$47.59	$23.72	$71.31
Millwright	6/1/2025		$49.72	$23.72	$73.44
Operators (Class 01 - see notes)	1/1/2025		$40.39	$24.23	$64.62
Operators (Class 01 - see notes)	1/1/2026		$41.96	$24.66	$66.62
Operators (Class 02 -see notes)	1/1/2025		$40.13	$24.23	$64.36
Operators (Class 02 -see notes)	1/1/2026		$41.70	$24.66	$66.36
Operators (Class 03 - See notes)	1/1/2025		$36.48	$24.23	$60.71
Operators (Class 03 - See notes)	1/1/2026		$38.05	$24.66	$62.71
Operators (Class 04 - See notes)	1/1/2025		$36.02	$24.23	$60.25
Operators (Class 04 - See notes)	1/1/2026		$37.59	$24.66	$62.25
Operators (Class 05 - See notes)	1/1/2025		$35.77	$24.23	$60.00
Operators (Class 05 - See notes)	1/1/2026		$37.34	$24.66	$62.00
Operators Class 1-A	1/1/2025		$43.39	$24.23	$67.62
Operators Class 1-A	1/1/2026		$44.96	$24.66	$69.62

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 26-04072 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Operators Class 1-B	1/1/2025		$42.39	$24.23	$66.62
Operators Class 1-B	1/1/2026		$43.96	$24.66	$68.62
Painters Class 1 (see notes)	6/1/2022		$34.45	$22.82	$57.27
Painters Class 2 (see notes)	6/1/2025		$40.36	$25.81	$66.17
Painters Class 3 (see notes)	6/1/2025		$43.68	$25.81	$69.49
Painters Class 4 (see notes)	6/1/2019		$28.20	$20.06	$48.26
Painters Class 5 (see notes)	6/1/2019		$22.91	$20.06	$42.97
Pile Driver Divers (Building, Heavy, Highway)	1/1/2025		$62.82	$22.72	$85.54
Pile Driver Divers (Building, Heavy, Highway)	1/1/2026		$64.70	$23.47	$88.17
Piledrivers	1/1/2025		$41.88	$22.72	$64.60
Piledrivers	1/1/2026		$43.13	$23.47	$66.60
Steamfitters (Heavy and Highway - Gas Distribution)	5/1/2022		$48.43	$40.28	$88.71
Truckdriver class 1(see notes)	1/1/2025		$36.43	$23.21	$59.64
Truckdriver class 1(see notes)	1/1/2026		$37.93	$23.71	$61.64
Truckdriver class 2 (see notes)	1/1/2025		$36.89	$23.52	$60.41
Truckdriver class 2 (see notes)	1/1/2026		$38.39	$24.02	$62.41

D. CONSTRUCITON INFORMATION

GENERAL NOTES
EYLER FARM
ROOFED HEAVY USE AREA
BLAIR COUNTY, PENNSYLVANIA

1. Prepare site, supply and install all components of the Roofed Heavy Use Area to the dimensions, elevations, and locations shown on the drawings. The components of the system include the following:

   A. Roofed Heavy Use Area
   B. Water Well
   C. Grassed Waterway
   C. All Excavation. Backfilling and Construction Required to Install All Components
   D. Seed, Lime, Fertilizer, and Mulch
   E. Erosion and Sedimentation Controls
   F. All Labor, Equipment, Tools, and Other Items Necessary and Incidental to the Work

Payment shall be by lump sum.

1. A copy of the specifications and drawings shall be on site during all phases of construction.

2. It is the responsibility of the contractor to implement all measures necessary to protect work-in progress from environmental conditions such as temperature extremes, surface and ground water, etc.

3. **All critical work that is indicated in the additional conditions shall be done Monday through Friday between the hours of 8:00 am and 4:30 pm.**

4. ONE CALL – It is the responsibility of the excavator to comply with the provisions of Act 187 to check for underground utilities before performing excavation work. Serial No_____

5. Refer to the Contractor's Notification list for the required notification of the Engineer's office during construction. Refer to page 5 of the Contractor's Handbook.

6. Refer to and comply with all requirements on the design.

7. Implement correct erosion and sediment control measures.

8. OSHA regulations shall be followed at all times.

9. A pre-construction conference between the farm, Engineer and district staff is required seven (7) days prior to starting work.

11. The contractor is responsible for the security of the job until the work has been certified by the Engineer.

12. In the event rock is encountered during excavation, stop excavation and notify the Engineer and district personnel. The Engineer and District must be notified in order to receive a rock modification to the contract.

13. Rock excavation shall be defined as the excavation of all hard, compacted, or cemented materials: The accomplishment of which requires blasting or the use of rear-mounted, heavy duty, single tooth, ripping attachment mounted on a tractor having a power rating of 200 to 300 net horsepower (at the flywheel).

14. Presence of isolated boulders or rock fragments larger than one cubic yard in size will not in itself be sufficient cause to change the classification of the surrounding material.

15. It is the responsibility of the Contractor to adhere to the **PA State Prevailing Wage** requirements. This includes providing copies of weekly payroll sheets to the landowner. The first and last week of payroll sheets need to be notarized. Prevailing wage and payroll sheets need to be provided for all contractors and sub-contractors.

CERTIFICATION OF CONFORMANCE

The undersigned primary manufacturer/supplier has furnished to:

Farmer's Name: Deloris Eyler
Address: 129 Eyler Ln
City/State/Zip: East Freedom, PA 16637
Type of Project: Roofed Heavy Use Area

And hereby states that the quality of work and materials meets the requirements as set forth of Standard Drawings No. _ _____and/or Specification No. _ ____ previously concurred in by the Natural Resources Conservation Service.

Name of Manufacturer/Supplier:_____

_____

Signature/Title/Date:_____

Description of Items Completed:_____

_____

_____

In addition, the landowner and/or the following subcontractors were also involved in the installation and they hereby certify their work meets the requirements of the drawings and/or specifications as stated previously.

Landowner Signature/Date:_____

Description of Items Completed:_____

_____

_____

Subcontractor Signature/Date:_____

Description of Items Completed_____

_____

_____

Subcontractor Signature/Date:_____

Description of Items Completed:_____

_____

_____

****

Received By:_____

Signature Title Date

Note: It is the primary manufacturer/supplier's responsibility to obtain and furnish all required signatures.

USDA United States Department of Agriculture

Natural Resources Conservation Service
PRACTICE SPECIFICATION
WASTE STORAGE FACILITY
(Code 313)

1. SCOPE

The work shall consist of furnishing materials and installing all components of the waste storage structure as outlined in this specification and the drawings.

Construction work covered by this specification shall not be performed between December 1 and the following March 15 unless the site conditions and/or the construction methods to be used have been reviewed and approved by the Engineer or his/her designated Representative.

2. MATERIALS

All materials used shall conform to the quality and grade noted on the drawings, set forth in Section 9, or as otherwise listed below:

PORTLAND CEMENT shall be Type I, IA, IL, II or IIA and conform to ASTM-C150, unless otherwise set forth in Section 9. Type IS Portland blast-furnace slag cement, Type IP Portland-pozzolan cement, or Type IL Portland-limestone cement shall conform to the requirements of ASTM C595 and may be used unless prohibited by the specifications. If Type I, IL, or II is used, an air-entrainment agent shall be used.

CONCRETE AGGREGATE shall meet the requirements and gradation specified in ASTM-C33. Coarse aggregate shall meet the gradation for size numbers 57 or 67.

WATER used in mixing or curing concrete shall be clean and free from injurious amounts of oil, acid, salt, organic matter or other deleterious substances.

REINFORCEMENT BARS shall be grade 40 or higher, and shall conform to ASTM- A615, A616, or A617. Welded wire fabric reinforcement shall conform to ASTM-A185 or A497. Reinforcement shall be free from loose rust, oil, grease, curing compound, paint or other deleterious coatings.

CONCRETE ADMIXTURES shall conform to ASTM-C260 for air-entrainment, and ASTM- C494, type A, D, F or G, for water- reduction and set-retardation, and type C or E for non- corrosive accelerators.

POZZOLAN shall conform to ASTM-C618, Class F, except loss of ignition shall not exceed 3.0 percent.

CURING COMPOUND shall meet the requirements of ASTM-C309, Type 1-D or Type 2 Class A or B or as otherwise required in Section 9.

MASONRY COMPONENTS shall meet the requirements of ASTM-C90 & C270 and placed in accordance with ACI-530.

PRECAST CONCRETE units shall comply with ACI-533 and PennDOT publication 408 Section 714.

PREFORMED EXPANSION JOINT FILLER shall conform to the requirements of ASTM-D1752, Type I, II, or III, unless bituminous type is specified, in which case it shall conform to ASTM-D994 or D1751.

JOINT SEALERS shall conform to the requirements for ASTM-C920, Federal Specification SS-S-210A, or Federal Specification TT-S-227, as appropriate for the specific application.

WATERSTOPS. Vinyl-chloride polymer types shall be tested in accordance with Federal Test Method Standard No. 601 and shall show no sign of web failure due to brittleness at a temperature of -35 degrees Fahrenheit. Colloidal (bentonite) waterstops shall be at least 75 percent bentonite in accordance with Federal Specification SS- S-210A. Non-colloidal waterstops shall only be used if approved by the Engineer.

METALS shall conform to the following

standards: Structural steel - ASTM-A36

Carbon steel - ASTM-A283, grade C or D; or A611, grade D; or A570, grade C or D
Aluminum alloy - ASTM-B308, B429, B221, B210, B211, or B209

Bolts - ASTM-A307; zinc coating shall conform to ASTM-A153, B633 (cond. SC3), A165 (type TS).

Screws - wrought iron or medium steel Split or tooth-ring connectors - hot-rolled, low carbon steel conforming to ASTM- A711, grade 1015

WOOD shall be graded and stamped by an agency accredited by the American Lumber Standards Committee as meeting the required species, grade, and moisture content.

PRESSURE TREATED WOOD PRODUCTS shall be Douglas Fir, Southern Yellow Pine, or as otherwise specified on the drawings or in Section 9. Use preservative-treated wood when wood members are exposed to animal waste or elements that deteriorate wood. Preservative-treated wood must meet the applicable American Wood Protection Association (AWPA) Standards or have an evaluation service report (ESR) prepared by an organization recognized by the International Code Council (ICC). Treated wood in contact with animal wastes or as critical components that are difficult to replace, shall meet AWPA UC4B or equivalent for heavy-duty ground contact.

FASTNERERS. Aluminum fasteners, connectors, or cladding must not be used in direct contact with treated wood unless specifically allowed by the preservative manufacturer. Use hot-dipped galvanized or stainless-steel bolts, washers, nuts, nails, and other hardware which meet American Society for Testing and Materials (ASTM) specifications A153 for fasteners and ASTM A653 coating designation G185 for sheet metal connectors, or ASTM A240 for Type 304 or 316 stainless steel, except as noted below. Fasteners and connectors of other materials may be used if specifically allowed by the preservative manufacturer. All fasteners, connectors, and any other metal in contact with Alkaline Copper Quaternary (ACQ), Copper Azole (CA), Micronized Copper Azole (MCA), or Dispersed Copper Azole (µCA-C) treated wood shall be stainless steel if AWPA Use Category UC4B applies or if constant, repetitive, or long periods of wet conditions may occur. All fasteners, connectors, and any other metal in contact with wood treated with Ammoniacal Copper Zinc Arsenate (ACZA) or any other preservative containing ammonia must be stainless steel.

DRAINFILL AGGREGATE shall meet the requirements of Penn DOT, Publication 408, Section 703, fine and coarse aggregate. The size and gradation shall be as specified in the additional conditions of this specification or on the drawings.

3. FOUNDATION PREPARATION AND CONDITIONS

All trees, brush, fences, and rubbish shall be cleared within the area of the structure, including any appurtenances, and borrow areas. All material removed by clearing and excavation operations shall be disposed of as directed by the Owner or his/her Representative. Sufficient topsoil shall be stockpiled in a convenient location for spreading on disturbed areas. All structures shall be set on undisturbed soil or non-yielding compacted material. Over excavation must be corrected as noted on the drawings or as directed by the Engineer or his/her designated Representative.

In addition to uniformity, the existing subgrade material must have sufficient strength to support the structure and its associated loads. Organic soils shall be removed. A compacted base course (layer of drainfill placed below the concrete prior to placement of concrete) may be used to improve the stability of the foundation or to control the movement of water. In addition, geosynthetics with an AOS between 20 and 100 may be used to further separate and/or stabilize the foundation. These items shall be as noted on the design or in Section 9.

Surface and subsurface drainage systems shall be installed and operating adequately to remove water from the foundation to allow for proper structure placement.

Concrete shall not be placed until the subgrade, forms and steel reinforcements have been inspected and approved by the Engineer or his/her designated Representative. Notification shall be given far enough in advance to provide time for the inspection.

Prior to placement of concrete, the forms and subgrade shall be free of chips, sawdust, debris, standing water, ice, snow, extraneous oil, mortar or other harmful substances or coatings.

Earth surfaces against which concrete is to be placed shall be firm and damp. Placement of concrete on mud, dried earth or uncompacted fill or frozen subgrade will not be permitted.

4. CAST-IN-PLACE CONCRETE STRUCTURES

a. Concrete Forms

Forms shall be of wood, plywood, steel, or other approved material and shall be mortar tight. The forms and associated falsework shall be substantial and unyielding and shall be constructed so that the finished concrete will conform to the specified dimensions and contours. Form surfaces shall be smooth and essentially free of holes, dents, sags, or other irregularities. Forms shall be coated with form oil before being set into place.

Care shall be taken to prevent form oil from coming in contact with steel reinforcement. All waterstop joints must be welded or otherwise made watertight, unless otherwise note on the design or in Section 9.

b. Concrete Mix

Concrete for structures shall have a 28-day compressive strength of at least 4000 psi, unless otherwise specified on the drawings or in Section 9. Upon request by the design engineer, the contractor shall be responsible for providing the concrete design mix, material certifications, and test result documentation. Current certification of the design mix by Penn DOT may be accepted in lieu of additional testing. Concrete order shall not be placed until the design mix has been approved by the design engineer.

The slump shall be 3 to 6 inches (without superplasticizers, if any); the air content by volume shall be five to seven percent of the volume of the concrete. Admixtures such as superplasticizers, water-reducers and set-retarders may be used provided they are approved by the Engineer prior to concrete placement and are used in accordance with the manufacturer's recommendations. Superplasticizers (ASTM C494, Type F or G) may be added to concrete that has a 2 to 4-inch slump before the addition. The slump shall not exceed 7½ inches with the addition of superplasticizer. The W/C ratio shall follow the requirements of the appropriate ACI.

Cementitious material may include fly ash meeting ASTM C-618 which may be substituted up to 25% by weight of total cement, or Ground Granulated Blast Furnace Slag meeting ASTM C-989 may be substituted up to 70% by weight of total cement unless otherwise note on the design of in Section 9.

c. Mixing and Handling Concrete

In general, concrete shall be transported, placed, and consolidated in accordance with ACI- 304, of which some specific interpretations are set forth below.

The supplier shall provide a batch ticket to the Owner or Technician with each load of concrete delivered to the site. The batch ticket shall state the class of concrete, any admixtures used, time out, and the amount of water that can be added at the site and still be within the design mix limits.

Concrete shall be uniform and thoroughly mixed when delivered to the job site. The Contractor shall test slump and air entrainment as necessary to ensure that the concrete meets the requirements of this specification. Variations in slump of more than one inch within a batch will be considered evidence of inadequate mixing and shall be corrected or rejected. No water in excess of the amount called for by the job design mix shall be added to the concrete.

For concrete mixed at the site, the mixing time after all cement, aggregates and water are in the mixer drum shall be at least 1-1/2 minutes.

Concrete shall be conveyed from the mixer to the forms as rapidly as practical by methods that will prevent segregation of the aggregates or loss of mortar. Concrete shall be placed in the forms within 1- 1/2 hours after the introduction of cement to the aggregate. In hot weather or under conditions when temperature of the concrete is 85°F or above, or conditions contribute to quick stiffening of the concrete, the time between the introduction of the cement to the aggregates and completion of truck discharge shall not exceed 45 minutes unless an approved set-retarding admixture is used in the mix.

Concrete shall not be dropped more than 5 feet vertically unless special equipment is used to prevent segregation.

Super plasticized concrete shall not be dropped more than 12 feet unless special equipment is used to prevent segregation.

Slab concrete shall be placed at the design thickness in one layer. Formed walls shall be placed in layers not more than 24-inches high, unless superplasticizer is used, in which case the maximum layer shall be 5 feet. Each layer shall be consolidated to insure a good bond with the preceding layer.

Immediately after placement, concrete shall be consolidated by spading and vibrating, or by spading and hand tamping. It shall be worked into corners and angles of the forms and around all reinforcement and embedded items in a manner that prevents segregation or in the formation of "honeycomb." Excessive vibration that results in segregation of materials will not be allowed. Vibration must not be used to make concrete flow in forms, slabs, or conveying equipment.

If the surface of a layer in place will develop its initial set, i.e., will not flow and merge with the succeeding layer when vibrated, a construction joint shall be made. Construction joints shall be made by cleaning the hardened concrete surface to exposed aggregate by sandblasting, air/water jetting, or hand scrubbing with wire brush, and keeping the concrete surface moist for at least one hour prior to placement of new concrete.

Concrete surfaces do not require extensive finishing work; however, the surface shall be smooth and even with concrete paste worked to the surface to fill all voids. The concrete surface must be watertight. Careful screeding (striking-off) and/or wood float finishing shall be required, unless otherwise shown on the drawings. Exposed edges shall be chamfered, either with form molding or molding tools.

The addition of dry cement or water to the surface of screeded concrete to expedite finishing is not allowed.

d. Reinforcing Steel Placement

Reinforcement shall be accurately placed and secured in position in a manner that will prevent its displacement during the placement of concrete. In forms, this shall be accomplished by tying temperature and shrinkage steel or special tie bars (not stress steel) to the form "snap ties" or by other methods of tying. In slabs, steel or wire shall be supported by precast concrete bricks (not clay bricks), or metal or plastic chairs. Concrete bricks supporting steel and wire must be full and not broken (unless bricks are manufactured with creases or indentations meant to be broken). Except for dowel rods, placing steel reinforcement into concrete already in place shall not be permitted.

The following tolerances will be allowed in the placement of reinforcing bars shown on the drawings:

1. Maximum reduction in cover: from formed and exposed surfaces – ¼ inch from earth surfaces - ½ inch
2. Maximum variation from indicated spacing: 1/12th of indicated spacing

Splices of reinforcing bars shall be made only at the locations shown on the drawings, unless otherwise approved by the Engineer. Unless otherwise required, welded wire fabric shall be spliced by overlapping sections at least one full mesh dimension plus two inches. All reinforcement splices shall be in accordance with the design.

Reinforcing steel shall not be welded, unless approved by the Designer. The ends of all reinforcing steel shall be covered with at least 1-1/2 inches of concrete.

e. Curing

Concrete shall be prevented from drying for at least seven days after it is placed. Exposed surfaces shall be kept continuously moist during this period by covering with moistened canvas, burlap, straw, sand or other approved material unless they are sprayed with a curing compound. Wooden forms left in place during the curing period shall be kept wet.

Concrete, except at construction joints, may be coated with a curing compound in lieu of continuous application of moisture. The compound shall be sprayed on moist concrete surfaces as soon as free water has disappeared but shall not be applied to any surface until patching, repairs and finishing of that surface are completed. Concrete shall be wet cured or remain in forms until immediately before patching, repairs, or finishing is performed. Curing compound shall not be allowed on any rebars.

Curing compound shall be applied in a uniform layer over all surfaces requiring protection at a rate of not less than one gallon per 150 square feet of surface. Surfaces subjected to heavy rainfall or running water within three hours after the curing compound has been applied, or otherwise damaged, shall be resprayed.

Any construction activity which disturbs the curing material shall be avoided during the curing period. If the curing material is subsequently disturbed, it shall be reapplied immediately.

Steel tying or form construction adjacent to new concrete shall not be started until the concrete has cured at least 24 hours.

Vehicles, overlying structures, or other heavy loads shall not be placed on new concrete slabs for at least three days, unless the concrete strength can be shown to be adequate to support such loads.

f. Form Removal and Concrete Repair

Forms for walls and columns shall not be removed for at least 24 hours after placing the concrete. When forms are removed in less than seven days, the exposed concrete shall be sprayed with a curing compound or be kept wet continuously for the remainder of the curing period. Forms which support beams or covers shall not be removed for at least seven days, or 14 days if they are to support forms or shoring.

Forms shall be removed in such a way as to prevent damage to the concrete. Forms shall be removed before walls are backfilled. Columns shall be at least seven days old before any structural loads are applied. Column base brackets shall not be loaded until the supporting concrete is at least seven days old. Drilling and setting column base brackets shall not be performed until supporting concrete is at least seven days old.

Concrete repairs including crack repairs shall be considered by the engineer on a case-by-case basis.

Where minor areas of the concrete surface are "honeycombed," damaged or otherwise defective, the area shall be cleaned, wetted and then filled with a dry-pack mortar or other approved repair products as approved by the design engineer. Dry-pack mortar shall consist of one- part Portland cement and three parts sand with just enough water to produce a workable paste or refer to the Portland Cement Association's *Design and*

Control of Concrete Mixtures (PCA) manual. All form tie holes shall be patched (both the sides of walls). Concreting in Cold Weather shall be performed in accordance with ACI- 306R or equivalent measures to adequately protect concrete from freezing risks. In addition, the contractor shall provide a written plan at least 24 hours in advance of placing concrete in cold weather and shall have the necessary equipment and materials on the job site before the placement begins.

g. Concreting in Hot Weather

Concreting in hot weather shall be performed in accordance with ACI 305.

The supplier shall apply effective means to maintain the temperature of concrete below 90 degrees Fahrenheit during mixing and conveying. Exposed surfaces shall be continuously moistened by means of
fog spray or otherwise protected from drying during the time between placement and finishing and during curing. Concrete with a temperature above 90 degrees Fahrenheit shall not be placed.

h. Backfilling New Concrete Walls

Backfilling and compaction of fill adjacent to new concrete walls shall not begin in less than 14 days after placement of the concrete, except that walls that can be backfilled on both sides simultaneously may be done so within seven days.

Heavy equipment shall not be allowed within three feet of a new concrete wall. Provide compaction near the wall by means of hand tamping or small, manually-directed equipment.

5. WOOD STRUCTURES

All framing shall be true and exact. Timber and lumber shall be accurately cut and assembled to a close fit and shall have even bearing over the entire contact surfaces.

Nails and spikes shall be driven with just sufficient force to set the heads flush with the wood surface. Deep hammer marks in the wood shall be considered evidence of poor workmanship and may be sufficient cause for rejection of the work.

Holes for lag screws shall be bored with a bit not larger than the body of the screw at the base of the thread. Holes for bolts shall be bored with a bit no more than 1/16" larger than the bolt diameter to achieve a snug fit without forcibly driving the bolt.

Washers shall be used in contact with all bolt heads and nuts that would otherwise be in contact with wood.

All joints shall be fastened with the number, type, and size of fasteners specified, at the locations or spacing specified.

If field cuts of pressure-treated wood expose untreated interior wood, the untreated surfaces shall be covered with two coats of a liquid preservative, as approved by the Engineer.

Wood structures shall be backfilled within the limits shown on the drawings by placing material in uniform lifts not to exceed nine inches. Compaction within three feet of walls shall be accomplished by means of hand tamping or small manually-directed equipment.

6. STRUCTURES INSTALLED ACCORDING TO STANDARD DETAIL DRAWINGS PREPARED BY OTHERS

Commercially available structures shall be installed as shown on the drawings provided to and concurred in by NRCS. All materials furnished and installed shall conform to the quality and grade noted on the drawings. A site-specific set of construction drawings shall be at the site during construction.

Modification of the structure outside limits shown on the drawings shall not be made without prior review and approval by the Engineer with appropriate approval authority. The Supplier or Contractor who submitted the original standard detail drawings shall be responsible for making any changes. Sufficient design documentation to allow an adequate review of the proposed modification shall accompany any request for a change.

Within thirty (30) days of the completion of construction of the structure, the Contractor or Supplier shall furnish written certification to the Engineer that all aspects of the installation are in conformance with the requirements of the drawings and specifications.

7. BURIED TANKS

a. Tank Condition

Tanks, whether steel or fiberglass/plastic, shall have sufficient strength to withstand design loads, be watertight, and be protected from corrosion. New tanks shall have a manufacturer's certification to this effect.

Used tanks must be inspected for pitting, corrosion, and cracks that could impair the strength or water tightness. No pitting, corrosion, or cracks shall be allowed that would impair the strength or water-tightness of the tank.

Tanks which originally stored leaded fuels may have tetraethyl lead deposits and scale on the inside. This material should be detached from the tank's interior, pumped out, and disposed of in a manner which will not pollute ground or surface waters. Also, if welding, handling, etc. is done, safety precautions should be taken to avoid ingesting or inhaling the lead or its fumes. (These tanks may have gasoline fumes or vapors in them and may explode from a spark, welding arc or torch.)

A tank that has been bent or dented will not be accepted unless adequate repairs have been made to restore the strength, water tightness, and corrosion protection. When inlet or outlet pipes or other type of openings are to be cut into one of these tanks, the reduced strength must be considered when the tank is put into use. The Steel Tank Institute's STI- P3 certification procedure shall be used to evaluate the structural integrity and assure the corrosion protection of steel tanks which have been repaired or modified.

b. Installation

Underground tanks shall be handled and installed according to the manufacturer's recommended procedures.

At a minimum, all tanks shall be set on a firm earth foundation or a full-length concrete slab covered with six inches of clean sand. The tank shall be surrounded by clean sand or well- tamped earth, free from stones and other debris. The use of saddles or "chock blocks" of any sort interferes with the proper distribution of the backfill loads and shall not be permitted.

The excavation shall be dewatered during installation and backfill operations. The backfill shall be well compacted, particularly under the tank, to provide adequate support.

Tanks shall be covered with a minimum of two feet of earth, or with not less than one foot of earth on which is placed a reinforced concrete slab not less than four inches thick. Tank installations, which will be subjected to traffic, shall have adequate strength to withstand the anticipated overload. Tanks shall be protected against damage from vehicles passing over them by at least three feet of earth cover or by 18 inches of well-tamped earth plus either eight inches of asphaltic paving or six inches of reinforced concrete. The paving or concrete shall be placed to extend at least one foot horizontally in all directions beyond the outline of the tank.

Tanks shall not be filled or even partially filled during their installation and backfilling.

Unless high ground water levels are not expected, the site shall have a drain system to prevent ground water from flooding around the tank. Where a tank may become buoyant due to a rise in the level of the water table or due to location in an area subjected to flooding, applicable precautions shall be taken to anchor the tank in place or dewater the site.

Openings on all underground tanks must be properly located and maintained in place during backfilling.

8. PIPES

Excavation for pipes shall be made to the grades and lines shown on the drawings or as indicated by construction stakes. Care should be taken not to excavate below the depths specified. Excavation below grade shall be corrected by placing firmly compacted layers of moist earth to provide a good foundation. If rock or boulders are exposed in the bottom of the excavation, they shall be removed to a minimum depth of eight inches below the invert grade of the pipe and any appurtenances and replaced with firmly compacted earth to the specified grade.

Pipes shall be backfilled with horizontal lifts of moist earth not to exceed four inches in thickness, or with other material as specified in Section 9 or in the drawings.
Each lift shall be compacted by hand tampers or other compaction equipment, however at no time shall driven equipment tires or tracks be within two feet of pipes or appurtenances.

All connections between pipes and structure walls and floors shall be water-tight and capable of withstanding the expected operating pressures.

9. ADDITIONAL CONDITIONS WHICH APPLY TO THIS PROJECT ARE:

Practice Specification
Critical Area Planting (Code 342)

1. SCOPE

The work shall consist of furnishing and planting the plant materials as set forth in the drawings and/or Section 7.

Critical area planting specifications are divided into four subsections based on the type of vegetation to be established:

Temporary cover

Permanent cover – seeding grasses and legumes

Permanent cover – sod establishment

Permanent cover – trees & shrubs

2. TEMPORARY COVER

A. MULCHING – Unless otherwise set forth in Section 7, use if the period of soil exposure without permanent vegetation will be less than two months, temporary vegetation is not feasible, or where seeding is delayed because of weather conditions. Follow the specification for Mulching (PA484).

B. ANNUAL GRASS or CERAEL GRAIN – Unless otherwise set forth in Section 7, use on all sediment producing areas where the period of soil exposure will be more than two months, but less than 12 months.

1. Site Preparation
   a. Install all required water control measures (temporary and permanent) prior to cover application.
   b. Perform all cultural operations at right angles to the slope on slopes 3:1 or flatter.
   c. Apply agricultural lime according to the soil test. If no test results are available when ready to seed, apply at the rate of 8000 pounds per acre (200 pounds per 1000 square feet) on a 100 percent calcium carbonate equivalent basis as a preliminary application. Apply the balance recommended by the test when the results are received. If lime is to be worked into a depth of five inches or deeper, use the amount full recommended in the soil test report. Apply no more than 8000 pounds per acre at one time if the limestone is to be worked into less than five inches. Apply the balance of the recommendation as the lime dissolves and infiltrates into the soil.

      Where pH levels are extremely low, it may not be feasible or practical to apply the lime all at once. In these cases, apply 6,000 pounds per acre (150 pounds per 1,000 square feet) on a 100 percent calcium carbonate equivalent basis for the temporary cover, and the balance of the test recommendation with the permanent cover.

   d. Apply fertilizer according to the soil test. If the test results are not available prior to seeding, apply 40 pounds each of actual N. P_2O_5, and K_2O per acre (1 pound each per 1000 square feet) as a preliminary application. Apply any balance recommended by the test when the results are received.
2. Materials
   a. Seed using the species or mixtures for the appropriate site type in **Table 1 Temporary Cover or Nurse Crop** unless otherwise set forth in Sections 7.
   b. All seed shall conform to the certifications of the PA Dept. of Agriculture and in addition, be labeled in accordance with the USDA Federal Seed Act in effect at the time of planting.
   c. No seed will be accepted with a test date more than 9 months before delivery to the site. Seed that is moldy or otherwise damaged will not be accepted.

3. Establishment
   a. Seeding rates shall be at the rates set forth in **Table 1 Temporary Cover or Nurse Crop**, unless otherwise set forth in Section 7.
   b. Cover grass seeds with ¼-inch, and small grains with 11/2-inches of soil by drilling, cultipacking, harrowing, or other suitable method when the site conditions permit; cultipack or track hydroseeded area where slopes will allow safe equipment operation.
   c. Mulch all seeded areas according to the construction specification for Mulching (PA484).

3. PERMANENT COVER – SEEDING GRASSES AND LEGUMES

A. SITE PREPARATION

1. Install all required water control measures (temporary and permanent) prior to cover application.
2. Perform all cultural operations at right angles to the slope on slopes 3:1 or flatter.
3. Where site conditions permit, prepare a seedbed by loosening the soil to a depth of 2 to 6 inches with suitable equipment. Where site conditions do not permit such normal seedbed preparation, loosen the soil surface by dragging a heavy chain or other suitable devices over the area to be seeded. Where possible on mined land, the surface should be left furrowed (as typically left by ripper teeth spaced 12 to 18 inches apart) when seeding herbaceous plants.
4. Apply agricultural lime according to the soil test. If no test results are available when ready to seed, apply at the rate of 8000 pounds per acre (200 pounds per 1000 square feet) on a 100 percent calcium carbonate equivalent basis as a preliminary application. Apply the balance recommended by the test when the results are received. If lime is to be worked into a depth of five inches or deeper, use the amount full recommended in the soil test report. Apply no more than 8000 pounds per acre at one time if the limestone is to be worked into less than five inches. Apply the balance of the recommendation as the lime dissolves and infiltrates into the soil.

   Where pH levels are extremely low, it may not be feasible or practical to apply the lime all at once. In these cases, apply the lime in increments of 6,000 pounds per acre (150 pounds per 1,000 square feet) on a 100 percent calcium carbonate equivalent basis and incorporate it before the next increment.
5. Apply nitrogen only when the plants will be actively growing during the period immediately following the application (March to May and August to October for cool- season grasses, June to August for warm- season grasses). On remote sites with poor access for standard fertilization (e.g., mine reclamation), apply all nitrogen as slow release compounds (e.g. ureaformaldehyde, sulfur-coated urea, other slow release formulation, animal manure, or sewage sludge), and at a rate of not greater than 80 pounds of actual nitrogen per acre (2 pounds per 1000 square feet) in any one application. On sites with good access (e.g. agricultural fields), apply 40% of the required nitrogen as slow release compounds, and no more than 40 pounds of actual nitrogen per acre (1 pound per 1000 square feet) in any one application.
6. Apply fertilizer according to a soil test. If test results are not available prior to seeding, apply as follows:
   a. Where a seedbed can be, prepared, apply 100 pounds each of actual $P_2 0_5$ and $K_2 0$ per acre (2.5 pounds each per 1OOO square feet) during seedbed preparation and at time of seeding. Apply 100 pounds of actual $P_2 0_5$ and 100 pounds actual $K_2 0$ per acre (2.5 pounds of actual $P_2 0_5$ and 2.5 pounds of actual $K_2 0$ per 1,000 square feet) as a preliminary application. Apply 40 pounds of actual N per acre (1 pound per 1,000) square feet) during the first period of active growth following the seeding. (Cattle manure or sewage sludge can be used to meet the nutrient requirements and will add needed organic matter when they can be incorporated into the soil. Heavy metal content of sewage sludge should not exceed that allowed on agricultural lands.) Test the soil before application and apply any balance recommended by the test when the results are received. Apply maintenance fertilizer the following growing season according to a soil test.

b. Where seedbed cannot be prepared, 80 pounds of actual $P_2 0_5$ and $K_2 0$ per acre (2 pounds of actual $P_2 0_5$ and 2 pounds of actual $K_2 0$ per 1,000 square feet) at time of seeding. Apply 40 pounds of actual N per acre (1 pound per 1,000 square feet) during the first period of active growth following the seeding.

c. If legumes are hydroseeded alone or in a mixture, use four times the normally recommended amount of inoculants to the slurry just before seeding, and apply lime and fertilizer by any method that will provide a uniform distribution.

B. MATERIALS

1. Apply seed species or mixtures as set forth in Section 7 and at the rates in **Table 2 Permanent Cover Grass and Legume Seeding Rates** for the permanent cover. Also apply a nurse crop seed mixture at the rates in **Table 1Temporary Cover or Nurse Crop** unless otherwise set forth in Section 7.
2. All seed shall conform to the certifications of the PA Dept. of Agriculture and in addition be labeled in accordance with the USDA Federal Seed Act in effect at the time of planting. No seed will be accepted with a test date more than 9 months before delivery to the site. Seed that is moldy or otherwise damaged will not be accepted.

C. ESTABLISHMENT

1. Where the seedbed is prepared:
   a. Smooth and firm the seedbed with a cultipacker or other similar equipment prior to seeding.
   b. Apply seeds uniformly by drilling, broadcasting, or hydroseeding. When broadcast or drilled, cover grass and legume seeds with ¼-inch of soil.Cultipack or track with a tracked- vehicle where slopes allow.
   c. Cultipack or track with a tracked- vehicle where slopes allow.
   d. Mulch all areas according to construction specification for Mulching (PA484).
2. Where seedbed is not prepared:
   a. Apply seed species or mixtures as set forth in Section 7 and at the rates in **Table 2 Permanent Cover Grass and Legume Seeding Rates** for the permanent cover. Also apply a nursery crop seed mixture at the rates in **Table 1 Temporary Cover and Nurse Crop**, unless otherwise set forth in Section 7.
   b. All seed shall conform to the certifications of the PA Dept. of Agriculture and in addition be labeled in accordance with the USDA Federal Seed Act in effect at the time of planting. No seed will be accepted with a test date more than 9 months before delivery to the site. Seed that is moldy or otherwise damaged will not be accepted.
   c. Apply seeds uniformly by drilling, broadcasting, or hydroseeding.
   d. Cultipack or track with a tracked- vehicle where slopes allow.
   e. Mulch all areas according to construction specification for Mulching (PA484).

4. PERMANENT COVER – ESTABLISHING SOD

A. SITE PREPARATION

1. Prepare the area, including lime and fertilizer, as set forth for Permanent Cover- Seeding in Section 3.A.
2. Till the soil surface to a depth of three inches and dampen immediately prior to laying sod.

B. MATERIALS

1. Sod shall be of the species set forth in Section 7.
2. Sod shall be grown from certified seed of adapted varieties, tested and approved by the PA Experiment Station, and under the cultural practices conducive to high quality sod that is free of any significant thatch, weeds, insects, and disease.
3. Sod shall be at least one-year old and no older than three years. Cultivated turfgrass shall be

considered ready for harvest when a cut portion of sod three feet in length and about 1-1/2 feet wide will support its own weight.

4. Cut sod of a width and length suited to the equipment and site, or as otherwise set forth in Section 7. Sod shall be cut, folded in the middle or rolled, and stacked on pallets. Folded sod shall be between 3 and 4 feet in length, unless otherwise allowed in Section 7. Sod shall be cut with a ½- to 1-inch layer of soil.
5. Have sod delivered to the site as soon as possible after harvesting. During hot weather, delivery shall be made within six hours. During cooler weather, when allowed in Section 7, delivery time may be extended up to 48 hours. Unless allowed in Section 7, sod shall not be planted during July and August, and when allowed shall be cut with at least 1-1/4 inch of soil and irrigated as necessary to ensure survival.

C. ESTABLISHMENT

1. Lay sod strips at right angles to the direction of water flow (slope), starting at the lowest elevation. Wedge the edges and ends of the sod strips together and tamp or roll. Stagger all end joints. Score the adjacent undisturbed ground so that the sod edges are flush and embedded (i.e. do not allow feathered edges).
2. On steep slopes or where required by Section 7, use wire or starch staples, fine mesh, or wooden pins and baler twine to secure the sod in place. When required in Section 7, remove wire and wooden stakes after the sod has rooted sufficiently to be secure.
3. Irrigate sod when dry conditions prevail to ensure survival. If required in Section 7, irrigate the sod to be lifted prior to harvesting.

5. PERMANENT COVER – TREES & SHRUBS ON HIGHLY DISTURBED AREAS

A. SITE PREPARATION

1. For seedings:
   a. Site preparation shall be the same as set forth in Sections 3.A. (1 through 3).
   b. Apply lime at the rate of 4000 pounds per acre on a 100-percent calcium carbonate basis over the area to be planted.
   c. Apply fertilizer at the rate of 40 pounds of actual P2O5 and 40 pounds of actual K2O per acre (1 pound per 1000 square feet) at the time of seeding. Apply 40 pounds of actual N per acre (1 pound per 1000 square feet) during the first period of active growth following the seeding. When strip-seeding, apply all of the fertilizer in the herbaceous strips.
2. For individual plantings:
   a. Prepare the area by clearing and mowing to allow access for planting and plant growth, or as otherwise set forth in Section 7.
   b. Planting pits in confined spaces or other harsh environments shall be excavated as recommended in *A guide to: Conservation Plantings in Critical Areas for the Northeast* (http://plant-materials.nrcs.usda.gov//nypmc/) unless otherwise set forth in Section 7.

B. MATERIALS

1. Plant species shall be as set forth in Section 7. Plant names required under this contract shall conform to those set forth in Standardized Plant Names, 1942 Edition, prepared by the American Joint Committee on Horticulture Nomenclature. Names not included therein shall conform to names generally accepted in the nursery trade.
2. All seed shall conform to the certifications of the PA Dept. of Agriculture and in addition be labeled in accordance with the USDA Federal Seed Act in effect at the time of planting. No seed will be accepted with a test date more than 9 months before delivery to the site. Seed that is moldy or otherwise damaged will not be accepted.
3. Plant materials shall be of the size and quality set forth in the rules adapted by the American Association of Nurserymen, Inc. and conform to the "American Standard for Nursery Stock". All

plants shall be supplied from plant hardiness zones 5 or 6, as described in Plant Hardiness Zone Map, USDA-ARS, Miscellaneous Publication No. 814.

4. All plant materials shall be full, well- branched and proportioned, particularly with respect to width and height. Plants shall have well developed branches and vigorous fibrous roots (except unrooted cuttings).Plants shall be free of defects, decay, injury, disease, insect infestation, or objectionable disfiguration.
5. The source(s) of plant materials shall be made known and available for inspection at least one week prior to planting. Plant identification and information labels shall be securely attached to each plant. Plants rejected shall be replaced with acceptable materials.

C. ESTABLISHMENT

1. Plant vegetation at the locations set forth in Section 7.
2. For seeds, where both are required, seed the herbaceous species in strips, with woody species between each strip. Orient strips on the contours, unless otherwise set forth in Section 7. Apply seeds uniformly by drilling, broadcasting, or hydroseeding. Cultipack or track with a tracked-vehicle where slopes allow.
3. For trees and shrubs, follow recommendations in *A guide to: Conservation Plantings in Critical Areas for the Northeast* (http://plant-materials.nrcs.usda.gov//nypmc/).

   Unless otherwise set forth in Section 7, plant conifers at the rate of 680 per acre, deciduous trees at the rate of 435 per acre (spacing 10' x 10'), shrubs at the rate of 2,700 per acre (spacing 4' x 4").
4. For bare root plants, protect the root systems from drying by treating roots with a moisture-retaining gel immediately upon arrival at the planting site.

6. TABLES

See Attached

7. ADDITIONAL CONDITIONS WHICH APPLY TO THIS PROJECT ARE:

TABLE 1: Temporary Cover or Nurse Crop

SPECIES OR MIXTURE	SEEDING RATE (LBS/ACRE)		RECOMMENDED SEEDING DATES PLANT HARDINESS ZONE		ADAPTATION		
	TEMPORARY COVER	NURSE	4 & 5	6 & 7	DROUGHTY	POORLY DRAINED	ACIDITY pH
Redtop	5	3	3/15 – 7/01 8/01 – 9/01	3/01 – 6/15 8/15 – 9/15	X	X	4.0 – 7.5
Annual Ryegrass	40	20	3/15 – 7/01 8/01 – 9/01	3/01 – 6/15 8/15 – 9/15	X	X	5.5 – 7.5
Spring Oats	96	48	3/15 – 7/01	3/01 – 6/15	X		5.5 – 7.0
Sudangrass	40	20	7/01 – 8/01	6/15 – 8/15	X		5.5 – 7.5
Japanese Millet (*Echinochloa frumentacea*)	30	15	7/01 – 8/01	6/15 – 8/15	X		4.5 – 7.0
Winter Rye Grain	168	56	8/01 – 11/01	8/15 – 11/15	X		5.5 – 7.5
Winter Wheat	180	90	8/01 – 11/01	8/15 – 11/15	X		5.0 – 7.0

TABLE 2 - Permanent Cover Grasses and Legumes Seeding Rates
(Use a nurse crop from Table 1 selected for the site conditions)

SPECIES OR MIXTURE[1]	SEEDING RATE (LBS/ACRE)		ADAPTATION		
	PREPARED DRILLED CULTIPACKED	UNPREPARED ADVERSE SITE HYDROSEEDED	DROUGHTY	POORLY DRAINED	ACIDITY pH
1. Tall Fescue	60	75	X	X	4.0 - 8.0
2. Tall Fescue and Red Fescue or Hard Fescue	40 10	60 15	X		5.0 - 7.5
3. Tall Fescue and	20	30	X	X	5.0 - 7.5
Birdsfoot Trefoil[2/3]	6	10			
4. Birdsfoot Trefoil[2/3] and Hard Fescue or Red Fescue	6 20	10 30	X		5.0 - 7.5
5. Crownvetch[2] and	10	15		X	6.0 - 7.5
Tall Fescue or Red Fescue or Hard Fescue or Perennial Ryegrass[4]	20	30			
6. Crownvetch[2] and	10	15	X		6.0 -7.5
Birdsfoot Trefoil[2/3] and	6	10			
Tall Fescue	20	30			

TABLE 2 - Permanent Cover Grasses and Legumes Seeding Rates cont.
(Use a nurse crop from Table 1 selected for the site conditions)

SPECIES OR MIXTURE[1]	SEEDING RATE (LBS/ACRE)		ADAPTATION		
	PREPARED DRILLED CULTIPACKED	UNPREPARED ADVERSE SITE HYDROSEEDED	DROUGHTY	POORLY DRAINED	ACIDITY pH
7. Flatpea[2/6] and	20	30	X		5.0- 7.5
Tall Fescue or	20	30			
Red Fescue or					
Hard Fescue or					
Perennial Ryegrass[4]					
8. Perennial Pea2/6 and	40	60			5.0-7.5
Tall Fescue or	20	30			
Red Fescue or					
Hard Fescue or					
Perennial Ryegrass[4]					
9. Alfalfa and[2/5]	10	15			6.5 - 7.5
Tall Fescue or	10	15			
Orchardgrass or	3	5			
Timothy[8]	4	6			

SPECIES OR MIXTURE[1]	SEEDING RATE (LBS/ACRE)		ADAPTATION		
	PREPARED DRILLED CULTIPACKED	UNPREPARED ADVERSE SITE HYDROSEEDED	DROUGHTY	POORLY DRAINED	ACIDITY pH
10. Birdsfoot Trefoil[2/3/5] and	6	10			
Tall Fescue or	6	10	X	X	5.0- 7.5
Orchardgrass or	3	5	X		
Timothy	2	3			
11. Perennial Ryegrass[4] and	25	30	X	X	5.0 - 8.0
Tall Fescue or	25	35			5.5 - 7.0
Kentucky Bluegrass	15	20			5.5 - 7.5
12. Switchgrass[5]	10	15	X	X	5.0- 7.5
13. Switchgrass and	10	15	X	X	5.0 -7.5
Birdsfoot Trefoil[2/3]	6	10			
14. Deertongue[5]	15	25	X		3.5 - 7.5
15. Deertongue[5] and	15	25	X		5.0 -7.5
Birdsfoot Trefoil[2/3]	6	10			

Footnotes for Table 2

[1]Consult the Agronomy Guide for cultivar recommendations of forage and turf species. Other species:

- Crownvetch 'Penn gift'
- Flatpea 'Lathco'
- Perennial Pea 'Lancer'
- Switchgrass 'Blackwell' - Erosion control
  - 'Cave-in-Rock' - Forage
  - 'Shelter' - Wildlife
- Deertongue 'Tioga'

[2]Inoculate legume seeds, use four times the normal rate of inoculate when hydroseeding.

[3]Birdsfoot Trefoil is not recommended in MLRA 148 and 149, where crown and root rots may injure the stand.

[4]Use only the "turf-type" fine-leaved perennial ryegrass varieties

[5]Use these mixtures on gentle, less erosive slopes; must be drilled or broadcast and cultipacked.

[6]Drill ½-inch deep or broadcast flatpea and perennial pea then cultipack.

Table 2a – Grass and Legume Seed Mixtures in Table 2 suitable for various areas or purposes.	
Area/Purpose	**Suitable Mixtures (Select One)**
Slopes and Banks – non-mowed	
Well drainage	**3, 4, 5, 6, 7, 8**
Variable drainage	3, 6
Slopes and Banks (mowed)	1, 2, 11
Gullies and eroded areas	**3, 4, 5, 6, 7, 8**
Conservation Structures	
Sod waterways, spillways, and other frequent waterflow areas	1, 2, 3
Drainage ditches	
Shallow, less than 3 feet	1, 2, 3
Deep, non-mowed	**5, 6, 7, 8**
Pond banks, dikes, levees, dams, diversion channels, and occasional waterflow areas	
Mowed areas	1, 2, 3, 4, 11
Non-mowed areas	**5, 6, 7, 8**
Hay or silage on diversion channels and occasional waterflow areas	use adapted hay mixtures or 9, 10
Sanitary landfill areas	3, 4, 5, 6, 12, 13, 14, 15
Strip-mined spoils, mine wastes, fly ash, slag, settling-basin residues, and other severely disturbed areas (lime to soil test)	**3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14,15**
Wildlife habitat	9, 10, 12, 13, 14, 15
Effluent Disposal Areas	**10, 12, 13**
Sand and Gravel Pits	12, 13, 14, 15

Table 2b – SEEDING DATES for species and mixes in Table 2 Permanent Cover Grasses and Legumes		
COOL SEASON PLANTS (MIXES 1 - 12)		
	Hardiness Zone 6 & 7	Hardiness Zone 4 & 5
Optimum	03/01- 04/15	03/15 - 05/01
Normal Range	11/15 - 06/15	11/01 - 07/01
	08/15 - 09/15	08/01 - 09/01
Project	11/15 - 09/15	01/01 - 09/01
WARM SEASON PLANTS (MIXES 12 - 15)		
	Hardiness Zone 6 & 7	Hardiness Zone 4 & 5
Optimal	03/01- 04/15	03/15 - 05/01
Normal Range	12/01 - 04/15	01/15 - 05/01

Table 3 – Trees suitable for highly disturbed areas

SPECIES	LOWER LIMIT pH TOLERANCE	TOLERANCE TO SHADE[1]	DRAINAGE ADAPTATION	ELEVATION[2]
CONIFERS				
Larch, Japanese	4.0	intermediate	Excessive – poor	
Pine, Austrian	4.0	intermediate	Well	
Pine, Pitch	4.0	intolerant	Excessive – well	Below 3000 feet
Pine, Red	4.0 – 4.5	intolerant	Excessive – well	Above 2000 feet
Pine, Scotch	4.0	intolerant	Well	
Pine, Virginia	4.0	intolerant	Excessive – well	Below 2500 feet
Pine, White	4.5	intermediate	Well – poor	
Spruce, Norway	4.5 – 5.0	tolerant	Well	
Spruce, White	4.5 – 5.0	tolerant	Well - poor	
HARDWOODS				
Alter, European Black	3.5	intolerant	Well-poor	Below 2500 feet
Aspen, Bigtooth	4.0	intolerant	Excessive-well	
Aspen, Quaking	4.0	intolerant	Excessive-well	
Birch, Gray	3.5	intolerant	Excessive-well	
Birch, Sweet	4.0	intermediate	Excessive-well	
Chestnut, Chinese	5.0	intermediate	Well	
Locust, Black[3] 'Steiner'	4.0	intolerant	Excessive-well	Below 3000 feet
Oak, Red	4.0	intermediate	Well	
Oak, Sawtooth 'Gobbler'	5.0	intolerant	Excessive-well	
Poplar, Hybrid	4.0 – 4.5	intolerant	Well	
Poplar, Yellow	4.5	intolerant	Well	Below 3000 feet
Sycamore	4.0 – 4.5	intolerant	Poor	Below 2500 feet

[1]Shade tolerance of species defined as follows: **Tolerant** – can withstand completely shaded conditions; **Intermediate** – partial shade is tolerated; plant requires some sunlight; **Intolerant** – plant requires full sunlight

[2]Blank spaces indicates no restriction: "Below" means that species are to be planted below this elevation

TREE PLANTING DATES: Plant as soon as frost is out of the ground but no later than April 15 in hardiness zones 6 & 7; May 1 in hardiness zones 4 & 5.

TABLE 4: Shrubs suitable for highly disturbed areas					
SPECIES[1]	LOWER LIMIT pH TOLERANCE	TOLERANCE TO SHADE[2]	DRAINAGE ADAPTATION	YEARS TO FRUIT MATURITY	MONTHS OF FRUIT MATURITY
Coral berry	5.0	tolerant	excessive-well	3	September – October
Crabapple	4.5 – 5.0	intolerant	well	3	September – October
Dogwood, Gray	5.0	intermediate	excessive-well	5	September – October
Dogwood, Silky	4.0	tolerant	well-poor	4 – 5	August – September
Honeysuckle, Amur	4.5 – 5.0	intermediate	excessive-well	3 – 4	September – October
Indigobush	4.0	intermediate	excessive-well	3	August
Locust, Bristly	3.5	intolerant	excessive-well	3 – 5	September
Privet, Amur	4.5 – 5.0	tolerant	well	4	September
Sumac, Aromatic	4.5	tolerant	excessive-well	5	July – August
Sumac, Shining	4.0	intermediate	excessive-well	4	September – October
Sumac, Smooth	4.5	intermediate	excessive-well	4	September – October
Viburnum, Arrowwood	4.5	tolerant	well-poor	3 – 5	September – October
Viburnum, Cranberrybush	4.5	intermediate	well-poor	3 – 5	August – September

[1]Recommended varieties are:

- Crabapple - 'Midwest', 'Roselow'
- Dogwood, Silky - 'Indigo'
- Honeysuckle, Amur - 'Rem Red'
- Locust, Bristly - 'Arnot'
- Sumac, Aromatic - 'Konza'

[2]Shade tolerance of species defined as follows;

- Intermediate - partial shade is tolerated; plant requires some sunlight
- Intolerant - plant requires full sunlight
- Tolerant - can withstand completely shaded conditions

PLANTING DATES: Plant as soon as frost is out of the ground but no later than:	
HARDINESS ZONE	**DATE**
6 & 7	04/15
4 & 5	05/01

Specific Site Requirements

USDA United States Department of Agriculture

Natural Resources Conservation Service
PRACTICE SPECIFICATION
DIVERSION
(Code 362)

1. SCOPE

The work shall consist of constructing diversions in the locations and to the grades and dimensions shown on the drawings or as stated in Section 7 of this specification.

2. MATERIAL

FILL MATERIAL used in constructing the earth fill portions of the diversion shall be obtained from the excavated area of the diversion channel, or other approved sources.

PIPE AND FITTINGS shall meet the size and material requirements as specified on the drawings or in Section 7 of this specification, when applicable.

OTHER required materials shall be as shown in the drawings or in Section 7 of this specification.

3. FOUNDATION PREPARATION

The base area of the ridge sections shall be stripped of vegetation, topsoil, and unsuitable material and scarified prior to placing fill. Topsoil shall be stockpiled and spread uniformly over the finished diversion ridge and channel, unless stated otherwise in the drawings or in Section 7 of this specification.

4. PIPE

Where specified, pipe shall be installed before earth placement unless otherwise stated on the drawings. The pipe shall be placed on a firm foundation with compacted backfill placed in horizontal lifts not exceeding 4 inches, to the lines and grades shown on the drawings.

5. PLACEMENT

Earth fill shall contain no frozen material, rocks greater than 6 inches in diameter, roots or wood greater than 2 inches in diameter or 4 inches in length, sod, brush, or other objectionable material.

The earth fill shall be compacted by routing the hauling and spreading equipment over the fill in such a manner that the entire surface of the fill will be traversed by not less than one track tread of the loaded equipment. The completed diversion shall conform to the cross section shown on the drawings, and be free of irregularities that would impede flow.

When an excess of earth material results from cutting the diversion to the cross section and grade, it shall be deposited adjacent to the diversion without blocking surface runoff from reaching the diversion, or another designated area where fill is needed. All disturbed areas should be seeded according to Specification PA342, Critical Area Planting, or as otherwise specified in Section 7 of this specification.

6. LEVEL SPREADER

Where specified, a level spreader shall be constructed on zero percent grade to ensure uniform spreading of sediment-free runoff (converting channel flow to sheet flow). Level spreaders shall be constructed on undisturbed soil (not on fill).

A geotextile erosion stop shall be placed vertically and at least six inches deep in a slit trench one foot back of the level lip and parallel with the lip. This erosion stop shall extend the entire length of the level lip and after backfilling with tamped soil the geotextile shall be trimmed so that the upper edge is flush with the soil surface. The entire level lip area shall be protected by placing two overlapping strips of jute or excelsior protective material.

Storm runoff converted to sheet flow shall outlet onto stabilized areas. Water shall not be concentrated immediately below the point of discharge.

7. ADDITIONAL CONDITIONS WHICH APPLY TO THIS PROJECT ARE:

USDA United States Department of Agriculture

NATURAL RESOURCES CONSERVATION SERVICE
PRACTICE SPECIFICATION
ROOFS AND COVERS
(Code 367)

1. SCOPE

The work shall consist of furnishing materials and installing all components of the roof or cover, as outlined in this specification and the drawings.

Construction work covered by this specification shall not be performed between December 1 and the following March 15 unless the site conditions and/or the construction methods to be used have been reviewed and approved by the Engineer or his/her designated Representative.

2. MATERIALS

All materials used shall conform to the quality and grade noted on the drawings, set forth in Section 10, or as otherwise listed below:

PORTLAND CEMENT shall be Type I, IA, IL, II or IIA and conform to ASTM-C150, unless otherwise set forth in Section 10. If Type I or II is used, an air-entrainment agent shall be used.

CONCRETE AGGREGATE shall meet the requirements and gradation specified in ASTM-C33. Coarse aggregate shall meet the gradation for size numbers 57 or 67.

WATER used in mixing or curing concrete shall be clean and free from injurious amounts of oil, acid, salt, organic matter or other deleterious substances.

REINFORCEMENT BARS shall be grade 40 or higher, and shall conform to ASTM- A615, A616, or A617. Welded wire fabric reinforcement shall conform to ASTM-A185 or A497. Reinforcement shall be free from loose rust, oil, grease, curing compound, paint or other deleterious coatings.

CONCRETE ADMIXTURES shall conform to ASTM-C260 for air-entrainment, and ASTM-C494, type A, D, F or G, for water- reduction and set-retardation, and type C or E for non-corrosive accelerators.

POZZOLAN shall conform to ASTM-C618, Class F, except loss of ignition shall not exceed 3.0 percent.

CURING COMPOUND shall meet the requirements of ASTM-C309, Type 2, Class A or B or as otherwise required in Section 10.

MASONRY COMPONENTS shall meet the requirements of ASTM-C90 & C270, and placed in accordance with ACI-530.

PRECAST CONCRETE units shall comply with ACI-525 and 533.

PREFORMED EXPANSION JOINT FILLER shall conform to the requirements of ASTM- D1752, Type I, II, or III, unless bituminous type is specified, in which case it shall conform to ASTM-D994 or D1751.

JOINT SEALERS shall conform to the requirements for ASTM-C920, Federal Specification SS-S-210A, or Federal Specification TT-S-227, as appropriate for the specific application.

WATERSTOPS. Vinyl-chloride polymer types shall be tested in accordance with Federal Test Method Standard No. 601, and shall show no sign of web failure due to brittleness at a temperature of -35 degrees Fahrenheit. Colloidal (bentonite) waterstops shall be at least 75 percent bentonite in accordance with Federal Specification SS- S-210A. Non-colloidal waterstops shall only be used if approved by the Engineer.

METAL ROOF SHEATHING shall be steel and a minimum of 29 gauge thick and shall have a protective coating installed on the face. Galvalume or other materials not warranted against corrosion associated with manure shall not be used.

METALS shall conform to the following standards:

Structural steel - ASTM-A36

Carbon steel - ASTM-A283, grade C or D; or A611, grade D; or A570, grade C or D

Aluminum alloy - ASTM-B308, B429, B221, B210, B211, or B209

Bolts - ASTM-A307; zinc coating shall conform to ASTM-A153, B633 (cond. SC3), A165 (type TS).

Screws - wrought iron or medium steel split or tooth-ring connectors - hot-rolled, low carbon steel conforming to ASTM- A711, grade 1015

WOOD shall be graded and stamped by an agency accredited by the American Lumber Standards Committee as meeting the required species, grade, and moisture content.

MANUFACTURED TRUSSES shall be certified as having been designed and built to Truss Plate Institute standards. Trusses must be designed to the minimum loading as listed in the design and sealed by a P.E.

PRESSURE TREATED WOOD PRODUCTS shall be Douglas Fir, Southern Yellow Pine, or as otherwise specified on the drawings or in Section 10. Use preservative-treated wood when wood members are exposed to animal waste or elements that deteriorate wood. Preservative-treated wood must meet the applicable American Wood Protection Association (AWPA) Standards or have an evaluation service report (ESR) prepared by an organization recognized by the International Code Council (ICC). Treated wood in contact with animal wastes or as critical components that are difficult to replace, shall meet AWPA UC4B or equivalent for heavy-duty ground contact.

Aluminum fasteners, connectors, or cladding must not be used in direct contact with treated wood unless specifically allowed by the preservative manufacturer. Use hot-dipped galvanized or stainless-steel bolts, washers, nuts, nails, and other hardware which meet American Society for Testing and Materials (ASTM) specifications A153 for fasteners and ASTM A653 coating designation G185 for sheet metal connectors, or ASTM A240 for Type 304 or 316 stainless steel, except as noted below. Fasteners and connectors of other materials may be used if specifically allowed by the preservative manufacturer. All fasteners, connectors, and any other metal in contact with Alkaline Copper Quaternary (ACQ), Copper Azole (CA), Micronized Copper Azole (MCA), or Dispersed Copper Azole (μCA-C) treated wood shall be stainless steel if AWPA Use Category UC4B applies or if constant, repetitive, or long periods of wet conditions may occur. All fasteners, connectors, and any other metal in contact with wood treated with Ammoniacal Copper Zinc Arsenate (ACZA) or any other preservative containing ammonia must be stainless steel.

GEOMEMBRANES shall comply with the requirements of Construction Specification PA521-PE/PP, as applicable.

3. FOUNDATION PREPARATION AND CONDITIONS

All trees, brush, fences, and rubbish shall be cleared within the area of the structure, including any appurtenances, and borrow areas. All material removed by clearing and excavation operations shall be disposed of as directed by the Owner or his/her Representative. Sufficient topsoil shall be stockpiled in a convenient location for spreading on disturbed areas. All structures shall be set on undisturbed soil or non-yielding compacted material. Over excavation must be corrected as noted on the drawings or as directed by the Engineer or his/her designated Representative.

In addition to uniformity, the existing subgrade material must have sufficient strength to support the structure and its associated loads. Organic soil or soils with high percentages of clays and silts shall be removed. A base course (a layer of granular material placed on the subgrade prior to placement of concrete) may be used to improve the stability of the foundation. In addition, geosynthetics may be used, if approved by the Engineer, to further separate and/or stabilize the foundation.

Surface and subsurface drainage systems shall be installed and operating adequately to remove water from the foundation to allow for proper structure placement.

Drainfill upon which concrete is to be placed shall be covered with a geosynthetic that has an AOS

between 20 and 100, inclusive.

4. CAST-IN-PLACE CONCRETE STRUCTURES

Refer to the Pennsylvania Field Office Technical Guide Section IV Code 313 Construction Specification for concrete requirements.

5. WOOD STRUCTURES

All framing shall be true and exact. Timber and lumber shall be accurately cut and assembled to a close fit and shall have even bearing over the entire contact surfaces. Nails and spikes shall be driven with just sufficient force to set the heads flush with the wood surface. Deep hammer marks in the wood shall be considered evidence of poor workmanship and may be sufficient cause for rejection of the work.

Washers shall be used in contact with all bolt heads and nuts that would otherwise be in contact with wood.

All joints shall be fastened with the number, type, and size of fasteners specified, at the locations or spacing specified.

If field cuts of pressure-treated wood expose untreated interior wood, the untreated surfaces shall be covered with two coats of a liquid preservative, as approved by the Engineer.

Roof trusses must be handled, installed, and braced according to the Truss Plate Institute's BCSI 1-03 "Guide to Good Practice for Handling, Installing & Bracing of Metal Plate Connected Wood Trusses." The contractor is responsible for temporarily bracing the trusses during erection. Permanent bracing shall be as shown on the construction drawings.

Wood structures shall be backfilled within the limits shown on the drawings by placing material in uniform lifts not to exceed nine inches. Compaction within three feet of walls shall be accomplished by means of hand tamping or small manually-directed equipment.

Lumber stored on the work site shall be close stacked off the ground. The ground beneath the stacked lumber shall be cleared of weeds and rubbish. Materials stacked on the work site for more than seven days shall be protected by a suitable waterproof covering.

The installation and workmanship of wood structures must meet the requirements of the American Wood Council (AWC) National Design Specification (NDS) for Wood Structures, or as otherwise shown on the construction drawings or contained in Section 10.

Roof and truss design must be based on the current version of American Society of Civil Engineers (ASCE) 7, Minimum Design Loads for Buildings and Other Structures, and the AWC NDS for Wood Construction and the NDS Supplement.

Roof design and trusses will be certified as meeting the requirements as shown on the construction drawings with the seal of a professional engineer licensed in the state where the trusses will be installed. Truss design and drawings must be submitted for NRCS review according to the timeframe specified in Section 10.

6. GEOMEMBRANE STRUCTURES

Geomembrane material conforming to the requirements of Material Specification 594, Geomembrane Liner, for the geomembrane material type specified in Section 10 of this specification must be used. The minimum nominal geomembrane thickness must be as shown in table 1 for the material and purpose specified in Section 10.

Table 1, Flexible geomembrane cover materials.

Geomembrane Type	Minimum Thickness Cover (mil)	
	Contains Biogas	Divert Clean Water
HDPE	40	30
LLDPE	40	30
LLDPE-R	36	24
PVC	40	30
EPDM	45	45
FPP	40	30
FPP-R	36	23
PE-R	NR	23

1 mil = $1/1000_{th}$ of an inch

HDPE - High Density Polyethylene

LLDPE - Linear Low-Density Polyethylene

LLDPE-R - Reinforced Low-Density Polyethylene

PVC – Polyvinyl Chloride

EPDM – Ethylene Propylene Diene Terpolymer

FPP – Flexible Polypropylene

FPP-R – Reinforced Flexible Polypropylene

PE-R – Reinforced, Slit-Film, Woven Polypropylene

NR – Not Recommended

All material must be free of damage or defect and stored to protect it from puncture, dirt, grease, water, moisture, mud, mechanical abrasions, excessive heat, or other damage. The rolls will be stored on a prepared surface (not wooden pallets) and should not be stacked more than two rolls high. Damaged material must be repaired or replaced.

Pipe Boots will be either factory fabricated from material determined by the cover manufacturer to be compatible with the geomembrane material, or field fabricated from the same material as the geomembrane cover. Clamps used for fastening boots to pipes will be 0.5-inch-wide stainless steel.

Gaskets, unless otherwise approved by the cover manufacturer, will be neoprene, closed-cell medium, 0.25 inch thick, with adhesive on one side.

Metal Battens will be 0.25 inch thick by 2 inches wide stainless steel. Bolts used for fastening battens to concrete will be stainless steel.

Embedded Channels, angles, and other metal shapes will be as specified on the construction drawings. Pipe used for aboveground transfer of biogas for pressurized systems will be of steel or plastic materials.

Steel pipe must conform to NRCS Standard Material Specification (MS) 554, Steel Pipe for black steel pipe or steel water pipe, 6 inches and larger, unless otherwise specified. Stainless

steel pipe must conform to American Society for Testing and Materials (ASTM) A312 or American Waterworks Association (AWWA) C220.

Plastic pipe must be HDPE conforming to NRCS Standard Material Specification (MS) 547, Plastic Pipe unless otherwise specified. Polyvinyl chloride (PVC) pipe is only acceptable for aboveground biogas transfer when the pipe conforms to MS 547 specifications for pressure rated SDR series, is ultraviolet light inhibited, and is modified for high impact strength. In paragraphs B.(1) and B.(2) of MS 547, the words "Construction Specification 45, Plastic Pipe" shall be replaced with "Practice Specification 367, Roofs and Covers, Flexible Covers"

Portland cement conforming to the requirements of Material Specification 531, Portland Cement, for the type specified in Section 10 of this specification must be used.

Concrete aggregate will consist of clean, hard, strong, and durable particles that are free of silt, clay, or any other material that may affect bonding of the cement paste. Fine and coarse aggregate will meet the requirements and gradation specified in ASTM C33. The maximum size of coarse aggregate will be 1-1/2 inches or as specified in Section 10 or as shown in the construction drawings.

Water used in mixing or curing must be clean and free from injurious amounts of oil, acid, salt, organic matter, or other deleterious substances.

Reinforcement bars must be Grade 40 or 60 or as shown on the construction drawings and must conform to ASTM A615. Welded wire fabric reinforcement must conform to ASTM A1064. Reinforcement must be free from loose rust, oil, grease, curing compound, paint, or other deleterious coatings. Use of fiberglass reinforcement is not allowed unless otherwise specified.

Pozzolan (fly ash) meeting the requirements of ASTM C618, Class F or C may be used to replace up to 20 percent by weight of the total required cement.

Concrete admixtures must conform to ASTM C260 for air-entrainment, ASTM C494, Types A, D, F, or G for water-reduction, and Types D or G for set-retardation when the air temperature is over 80 degrees Fahrenheit.

Curing compound must meet the requirements of ASTM C309, Type 2, Class A or B, or as otherwise required in Section 10 of this specification.

Concrete Slump will be in the specified range shown in Section 10 or on the construction drawings. Samples will be obtained according to ASTM C172 and tested according to ASTM C143. If such admixtures are specifically allowed, the maximum slump prior to and after addition of high-range water reducing admixtures (super plasticizers) will be as specified in Section 10.

Drainfill. When gravel bedding is shown on the construction drawings, the fill material will conform to ASTM C33.

Other Materials. All other materials used to construct the cover will be of the size, type, and quality as shown on the construction drawings, as recommended by the cover manufacturer, or as specified herein.

Semi-rigid and flexible covers which utilize geomembranes shall be installed as required by the manufacturer, and as otherwise set forth in Section 10 and Construction Specification PA521A-PE/PP.

7. GEOMEMBRANE INSTALLATION

The geomembrane cover will be installed with a minimum of handling by using a spreader bar assembly attached to a front-end loader or a track-hoe bucket, or in a manner recommended by the cover manufacturer. The cover will be secured during installation to

protect it from wind uplift. Cover panels will . seamed and secured by the end of each workday. Avoid placing the cover during periods of fog, precipitation or excessive winds.

Follow the cover manufacturer's recommendations for operating construction equipment on the geomembrane material. In the absence of manufacturer's recommendations, allow only rubber-tired equipment with a ground pressure of less than 5 pounds per square inch to be operated on the geomembrane.

Seals around pipe penetrations will be installed using a method recommended by the cover manufacturer unless otherwise specified in Section 10.

Field seams will be field welded or joined using the fabricator's seaming apparatus and technique for the specified type of geomembrane material (see below) unless otherwise recommended by the manufacturer. Prior to seaming, all areas which are to become seam interfaces will be cleaned of dust and dirt. Seam joining will not take place unless the sheet is dry. Seam welding will not take place when the ambient temperature is below 32 degrees F or above 104 degrees F.

HDPE, LLDPE, FPP. The primary method of seaming will be hot wedge fusion welding. Fillet extrusion welding will be used for repairs, T-seams, and detail work. Hot air fusion or chemical fusion welding may be used on chemical fusion welding, or an adhesive approved by the manufacturer. For each method of welding or joining use a procedure, including equipment calibration, recommended by the material manufacturer.

EPDM. Seams will be joined using double-faced inseam tape or a cover strip. Use the manufacturer's recommended materials and procedure for completing the seams.

Non-destructive seam testing will be done using a method and procedure recommended by the cover manufacturer and conforming to ASTM D5820 (air pressure tests), ASTM D5641 (vacuum box tests), or ASTM D4437 (air lance tests), as appropriate. The location of all defective seams will be marked and repaired.

Destructive seam testing, if required by the construction drawings, will be done on seam samples cut at no more than one sample per 500 feet of weld. All destructive seam samples will be tested in shear and peel modes according to ASTM D6392 to verify seams meet the requirements of table shown in this specification.

The cover material must be readily repairable. Tears, punctures, defective material, and failed seams will be repaired using the geomembrane manufacturer's recommended methods and procedures. Failed seams and other defective areas that have been repaired will be retested using the appropriate non- destructive method (see above.)

Factory-fabricated and field-fabricated pipe boots of the same material as the cover, will be field welded to the cover using the specified seaming method, then welded and clamped to pipes of the same material as the boot using the specified type of FPP. For each method of welding, use a procedure, including equipment calibration, recommended by the material manufacturer.

PVC. Seams will be joined using hot wedge fusion welding, hot air fusion welding,

clamp. Boots will be clamped to other types of pipe as shown on the construction drawings and the cover manufacturer's recommendations. All boot connections to pipes must provide a leak-free attachment.

Metal battens and embedded channels will be installed according to the construction drawings and the cover manufacturer's recommendations.

8. PRE-ENGINEERED METAL STRUCTURES

Design

The building system must be designed by, or in the responsible charge of, a professional engineer licensed in the state where the pre-engineered metal structure will be installed. The design criteria must be in accordance with the Metal Building Manufacturers' Association (MBMA) Metal Building Systems Manual. Roofing, siding, and other accessories must be designed in accordance with the MBMA Metal Building Systems Manual and the Metal Roofing Systems Design Manual. Gutters and downspouts must be sized in accordance with the MBMA Metal Building Systems Manual, and conform to the requirements of NRCS CPS Roof Runoff Structure (Code 558) where CPS 558 is an associated practice.

Structural Design Calculations

One copy of the manufacturer's design calculations for the building will be submitted to purchaser for review. Design calculations must be sealed by the manufacturer's professional engineer. Design calculations must include all necessary calculations to demonstrate that the strength and serviceability requirements of this specification have been met. Include the following:

-Summary of the criteria, codes, design loads, and load combinations used for the building design including the criteria listed in the current version of American Society of Civil Engineers (ASCE) 7, Minimum Design Loads for Buildings and Other Structures. In lieu of compliance with ASCE 7, use the applicable provisions of the current International Building Code (IBC) to develop design loads and load combinations.

-Deflection and drift calculations.

-Anchor Locations and Reactions - A drawing shall be submitted to the owner or contractor that provides the diameter, projection, and location of all required anchors and the unfactored reactions at each point influencing the foundation design for each design load (e.g., dead, live, snow, wind, seismic, etc.). For use in determining the anchor bolt diameter, anchor bolt material will be assumed to be ASTM F1554 Grade 36, unless otherwise specified in the pre-engineered metal building design documents.

Finish and Trim

Flashing, trim, caps, and closure pieces will be of the same material, finish, and color as adjacent material. Unless otherwise specified, all framing members will be factory-primed. Roofing and siding will be in manufacturer's standard colors. Trim, gutters, and downspouts will match in color.

Erection

Erection will be in accordance with the MBMA Metal Building Systems Manual, "Common Industry Practices." All field connections will be bolted, and all shop connections will be either bolted or welded.

Material Handling, Delivery, and Storage

Prefabricated components, sheets, panels, and other manufactured items, will be delivered and stored so that they cannot be damaged or deformed. If subjected to water accumulation, materials will be stored in such a manner so that they can drain freely. Sheets and panels will not be stored in contact with other materials that might cause staining or corrosion. All damaged material will be reported to purchaser to determine if replacement is required.

Maintenance Manual

Upon completion of installation, an electronic copy (such as a PDF) and one hard copy manual will be submitted that include the following letters of guarantee and warranties and maintenance instructions.

9. STRUCTURES INSTALLED ACCORDING TO STANDARD DETAIL DRAWINGS PREPARED BY OTHERS

All materials furnished and installed shall conform to the quality and grade noted on the drawings. A site-specific set of construction drawings shall be at the site during construction.

Modification of the structure outside limits shown on the drawings shall not be made without prior review and approval by the Engineer with appropriate approval authority. The Supplier or Contractor who submitted the original standard detail drawings shall be responsible for making any changes. Sufficient design documentation to allow an adequate review of the proposed modification shall accompany any request for a change.

Within thirty (30) days of the completion of construction of the structure, the Contractor or Supplier shall furnish written certification to the Engineer that all aspects of the installation are in conformance with the requirements of the drawings and specifications.

10. ADDITIONAL CONDITIONS WHICH APPLY TO THIS PROJECT ARE:

Supplement A – "Guidelines for Selecting Corrosion-Resistant Fasteners for Use with Preservative-Treated Wood"

Based on a review of technical information posted by the major U. S. preservative manufacturers and selected fastener and connector manufacturers, the following guidelines summarize the current state-of-practice regarding the selection of metal fasteners and connectors for use with ACQ and copper azole (CA) preservative-treated wood:

AWPA Use Category and Description	**Appropriate Fastener/Connector Types**
UC 3A or B – Exterior Construction, Above Ground UC 4A – Ground Contact or Fresh Water, Non-critical components	Fasteners Hot-Dipped (HD) Galvanized per ASTM A153 or Stainless Steel (SS), Type 304 or 316 Connectors HD Galvanized per ASTM A653, Class G185 or Stainless steel, Type 304 or 316
UC 4B - Ground Contact or Fresh Water, Critical components or difficult to replace	Stainless steel, Type 304 or 316

Other Preservatives:

1. For CCA-treated wood, HD galvanized fasteners and connectors as specified above are recommended. CCA is less corrosive than ACQ and CA.
2. For ACZA-treated wood, SS fasteners and connectors as specified above are recommended. ACZA contains ammonia and is significantly more corrosive than ACQ and CA.
3. For other preservatives, the more stringent of the preservative manufacturer's recommendations and the fastener/connector manufacturer's recommendations should be followed.

Notes regarding NRCS-type structures:

1. Use Category UC 3A and B include railings, decking, bracing, and slats on composter bins.
2. Use Category UC 4A includes posts such as those used in composter bins.
3. Use Category UC 4B includes structural building poles and permanent wood foundation.

USDA United States Department of Agriculture

FENCE

CODE 382

Pennsylvania Conservation Practice Specifications

These specifications supplement the conservation practice standard for Fence (382) and contain criteria primarily for livestock fences. Other types of fences may be applicable for other purposes.

Fences may be designed for permanent installation or for temporary use. **Permanent fences** are intended to be in place for long periods of time with minimum maintenance. They are constructed with durable materials that have a longer life span than temporary fencing materials.

Temporary (or portable) fences are designed to be in place for short periods of time and are often used as subdivision fences for frequent movement of animals where the location of the fence may not be the same from time to time. Temporary fencing offers maximum flexibility in rotational grazing systems for subdividing pastures to enhance grazing efficiency. ***Temporary fencing may also be used to provide short-term protection for streams and riparian areas but is not a long-term solution for restricting access to these and other environmentally sensitive areas.***

Categories of Fence. Livestock fences are categorized based on the degree of protection provided for the intended use, as follows:

- Critical confinement/exclusion fences – Are permanently installed fences used in areas where a high level of confinement or exclusion is needed. Fences along property lines, near public roads, or adjacent to hazardous areas are included in this category. Table 1 provides a selected list of critical confinement fences that are recommended for various types of livestock. ***Other types of critical confinement/exclusion fences may also be appropriate but must be approved in advance by NRCS.***

- Non-critical confinement/exclusion fences – Are permanently installed or temporary (portable) fences used in areas where a lower level of confinement or exclusion is acceptable. These fences are not as strong as critical confinement fences and are less effective for restraining livestock. A greater amount of attention is required of landowners and operators to contain livestock with temporary fencing. Divisional fences in pastures and other light-duty fences are included in this category. Table 2 provides recommendations for non-critical confinement electric fences for various types of livestock. ***Other types of non-critical confinement/exclusion fences may also be appropriate but must be approved in advance by NRCS.***

Refer to Tables 1 and 2 to determine the types of fences, fence heights, and wire spacings that are recommended for controlling specific types of livestock.

Fence Type or Style. Fence types are described based on materials, design, and uses:

- **Barbed wire fence** is generally used as a multi-strand permanent fencing material for perimeter fences, livestock containment areas, and interior subdivision fencing to facilitate grazing management. Barbed wire fencing is not recommended for horses, sheep, goats, or hogs.

- **Woven wire fences** are used as permanent fences for both perimeter and subdivision fences. Wire-spacing and height varies based on the type of animals being controlled. Woven wire fences consist of a series of horizontal (line) wires and vertical (stay) wires, and are offered in two main types: "hinge joint" and "continuous stay fixed knot." In a hinge joint woven wire fence, the vertical stays wrap around the line wires. In a continuous stay fixed knot fence, the vertical stay wires are fixed with another separate wire to the line wire. Both main fence types come in various designs (line and stay spacing), tensile strength grades, and metallic coating types and grades.

- **High tensile smooth wire fence** is commonly used as a multi-strand permanent fence for perimeter and subdivision purposes. It can be used to control most livestock when wires are properly spaced. Smooth wire may be steel, aluminum, or vinyl coated, and can be electrified or non-electrified.

- **Electric fences** may be permanent or temporary. The electrical power source can be from 110v or 220v electrical current or from a battery. Batteries may be recharged by solar or electrical grid power. Livestock must be trained to respect electric fences. Electric fences are referred to as "psychological barriers" for livestock, as compared to the physical barrier that other types of fences create. Numerous brands and styles of electric braid, twisted strands, tape, and netting are available. Electric mesh and netting are often used for predator exclusion for small livestock and "pastured" poultry.

- **Board fences** are usually wood and can be used for permanent and subdivision purposes. Vinyl and composite materials are also available, and may be acceptable when pre-approved by NRCS and installed according to manufacturer's instructions. Board fence is used primarily where aesthetics or animal safety is a concern and is most often used for horses and cattle.

- **Heavy use area containment fencing** is used to control access into and out of livestock feeding areas and other confinement areas. This fencing is usually constructed of board, steel pipe, high tensile smooth wire, or cable, and is built to sustain heavy use by livestock and equipment in a confined space.

- **Other fence types** include chain link, steel pipe, galvanized panel, guard rail, and cable fences. These are commonly used as safety fences adjacent to farmsteads and other structures to restrict access to unsafe or prohibited areas.

- **Non-conventional fencing** includes variations of fence systems that may be acceptable when pre-approved by NRCS and installed according to the manufacturer's instructions. These alternatives shall meet or exceed current specifications. Alternative fence systems may be applicable for horses and other animals that have special requirements for control.

The following tables provide specifications for commonly used types of fence and degree of protection:

- Table 3 – Woven Wire and Barbed Wire Fences for Critical Confinement/Exclusion.

- Table 4 – Wooden Board Fence for Critical Confinement/Exclusion.

- Table 5 – Chain Link Fence for Critical Confinement/Exclusion.

- Table 6 – High Tensile Smooth Wire for Critical Confinement/Exclusion Fences and Non-Critical Confinement/Exclusion (or Divisional) Fences.

- Table 7 – Electroplastic Twine (Polywire), Electrified Ribbon, and Galvanized Steel Braided Wire for Non-Critical Confinement/Exclusion (or Divisional) Fences.

- Table 8 – Summary of Fence Types and Selected Materials.

Refer to the Pennsylvania 382 Implementation Requirements sheets or Standard Drawings for details of fence types and components.

Fence Materials and Installation. The criteria in these specifications for size, gauge, amount, weight, or type of materials for each fence type and the post seating depths shall be regarded as minimums, unless otherwise specified by the fence manufacturer. Post spacing and wire spacing shall be regarded as maximums, unless otherwise specified by the fence manufacturer.

Materials requirements for specific types of fences are provided in Tables 3 to 7. Specifications are provided for wood and steel materials. Lumber dimensions are specified in ***nominal (common) sizes*** for commercial wood products. This is how lumber is labeled when it is sold. ***Actual sizes*** of commercial lumber used for fencing are usually 0.25 to 0.5 in. less than the nominal sizes for thickness and width, and are acceptable for this standard. For example, a 1 in. x 6 in. commercial wood board may actually be 0.75 in. x 5.5 in.; a 4 in. square commercial wood post may actually be 3.5 in. square. Differences in length are usually not significant. For example, a post sold as an 8-ft. 4 x 4 is generally very close to the full 8 feet in length.

Any materials or construction features that exceed these specifications or have equivalent or greater effectiveness as specified by the manufacturer, may be acceptable for meeting the criteria of the Fence (382) standard. Alternative materials (e.g., rigid polyvinyl chloride (PVC), fiberglass, wood/plastic composites) may be used for fence ***line posts***, provided they are:

- Not part of a safety fence or heavy use area containment fence (e.g., a fence around a waste storage facility or livestock confinement area).
- Specified by the manufacturer as having at least a 20-year lifespan and appropriate strength for the type of livestock or other animals to be controlled.
- Installed according to the manufacturer's instructions.

Other alternative materials or installation methods not described in these specifications may also be acceptable but must be approved in advance by NRCS. Landscape timbers are not acceptable materials for fence posts, battens, or braces.

For organic operations, the USDA National Organic Program (NOP) regulations state that a producer must not use lumber treated with arsenate or other prohibited materials (creosote, pentachlorophenol, etc.) for new installations or replacement purposes in organic production areas when it can come in contact with soil, crops, or livestock. The NOP prohibits the use of most (but not all) synthetics. Naturally decay-resistant wood (e.g., red cedar, black locust, Osage orange) can be used instead of pressure-treated pine but is often more expensive and may not be readily available from local suppliers. Choose posts that are primarily heartwood; the sapwood is not as decay resistant.

Alternatives to wood (e.g., steel, fiberglass, plastics, wood/plastic composites) may be an option for organic producers, but these materials can contain coatings and/or additives that could be interpreted as unacceptable according to the NOP regulations. Given this uncertainty, it is advisable to consult with the organic certifying agent when considering the use of materials other than natural products. Alternative materials may be determined acceptable from an organic standpoint, but some (especially plastics and wood/plastic composites) may not have been on the market long enough to assess their long-term strength and durability for fence posts, especially in high-stress applications. As noted above, ***alternative materials not described in these specifications must be approved in advance by NRCS.***

Prior to construction, the fence line shall be cleared of any obstruction that would hinder fence placement and operation. Clearing along stream banks will be held to a minimum except as required for stream crossings. The soil surface along the fence line shall be relatively smooth such that placement of the bottom wire does not exceed specified maximum wire spacing from soil surface.

Fence Posts – A post is a linear piece of wood, steel, or other material set upright in the ground to serve as support for the fence fabric. For each type of permanently installed fence, criteria are established for line, corner, end, gate, and brace posts, as applicable. Posts are defined as follows:

- Line posts – Primarily support the fence fabric and are not under significant tension. Line posts are set between the corner, end, gate, and brace post assemblies.

- Corner, end, gate, and brace posts – These posts support the fence fabric and are under tension from the pull of the fence. They are usually larger in diameter and are set deeper in the ground than line posts.

Set permanent posts perpendicular to the ground by driving, augering, or hand digging. Backfill material shall be hand tamped in 6-inch lifts. Posts need to be set below the frost line to prevent heaving.

For corner and end posts, and line posts on curves, install posts approximately 2 inches off vertical (leaning away from the direction of pull).

In extremely wet or very sandy soils, and in cases where posts cannot be set to the specified depth, the posts of permanently installed fences must be set in concrete to secure them. ***In all cases, permanent posts must be set firmly so that they cannot be moved horizontally or vertically by hand.***

Battens – Battens are narrow, slotted strips of wood or other non-conductive material (e.g., fiberglass, plastic) that are used as wire spacers to keep strands apart in high tensile smooth wire or barbed wire fences. Battens are supported by the fence wires and are not set in the ground.

Offset Brackets - Offset brackets can be attached to a standard (non-electric) fence to support an electric wire for electric subdivision fences, or to protect a standard fence from livestock damage. Offset brackets can be attached to the existing fence wires and/or fence posts. For wire attachment, use offset brackets made of galvanized (ASTM Class 3) high tensile spring wire with an insulator of high-density UV-stabilized polyethylene or porcelain. Other corrosion resistant offset brackets with insulators that attach directly to the fence posts can also be used.

Attach offset brackets spaced up to 60 feet apart to the standard fence, either on wire next to the post or on the post itself. Closer spacing is necessary in rolling terrain. Offset brackets must hold the electric wire at least 4 inches from the non- electrified fence material. Make sure no wires of the standard fence come in contact with the electric wire, as a short will occur. The electric wire should be tensioned just tight enough to take the slack out. A 12½ gauge galvanized wire (ASTM Class 3) with at least 170,000 PSI tensile strength is recommended for this purpose.

If control of livestock is desired along the standard fence, place offset brackets at nose height of the animals. For cattle, set the brackets at approximately 30 inches off the ground. For small ruminants, set brackets 18 to 24 inches off the ground. Consider adding a second offset wire at 6 to 8 inches off the ground so small ruminants cannot go under the fence, or coyotes and dogs do not get into the enclosure by digging under the fence.

Access Gates – Install gates at locations suitable for providing controlled access. Select gates of appropriate size and materials for the specific fencing system. Install prefabricated gates according to the manufacturer's instructions.

Flood Gates – Where a fence crosses a stream at a livestock crossing, install a flood gate (or water gap section) across the stream as needed to keep livestock within the fenced area. Construct the flood gate so as to minimize debris buildup and prevent structural damage to the fence during flooding events.

TABLE 1: Critical Confinement/Exclusion Livestock Fences: Recommendations for Fence Type, Height and Strand Spacing [1/]

Type of Livestock	Type of Fence				
	Woven Wire	**Barbed Wire**	**Wooden Board**	**Non-Electric High Tensile Smooth Wire**	**Electric High Tensile Smooth Wire**
Horses and Foals	Minimum of 48 inches high - 5 horizontal woven wires. Add at least one electrified smooth wire and/or a wooden rail (board) at the top of the woven wire to prevent horses from stretching the fence. If a board is used without an electric wire, note in the O&M that the board will need to be replaced periodically if damaged by horses.	Not recommended.	Minimum of 48 inches high with at least three (3) 6-inch boards. Openings between boards 6-12 inches. Bottom of the lowest board 6-12 inches above the ground. 3-board fence – Top board at 48 inches. Boards spaced at 15, 30, and 45 inches *on center* above the ground (~ 9-inch openings between boards). Bottom board: ~ 12-inch ground clearance. 4-board fence – Top board at 60 inches. Boards spaced at 12, 27, 42, and 57 inches *on center* above the ground (~ 9-inch openings between boards). Bottom board: ~ 9-inch ground clearance.	Minimum of 6 strands - spaced at 10, 20, 30, 40, 50, and 60 inches above the ground. To increase fence visibility, substitute one or more strands of vinyl coated wire or high tensile vinyl tape for the smooth wire.	Horses only (no foals) - Minimum of 3 strands (at least 2 electrified) - spaced at 30, 40, and 50 inches above the ground. With Foals - Minimum of 4 strands (at least 2 electrified) - spaced at 16, 26, 36, and 46 inches above the ground. To increase fence visibility, substitute one or more strands of vinyl coated wire or high tensile vinyl tape for the smooth wire.
Beef – Steers, Cows and Calves	Minimum of 48 inches high - 5 horizontal woven wires.	Minimum of 3 strands - spaced at 10 to 17 inches, 20 to 27 inches, and 32 to 38 inches above the ground.	Minimum of 48 inches high with at least three (3) 6-inch boards. Openings between boards 6-9 inches. Bottom of the lowest board 6-12 inches above the ground. 3-board fence – Top board at 48 inches. Boards spaced at 15, 30, and 45 inches *on center* above the ground (~ 9-inch openings between boards). Bottom board: ~ 12-inch ground clearance. 4-board fence – Top board at 48 inches. Boards spaced at 9, 21, 33, and 45 inches *on center* above the ground (~ 6-inch openings between boards). Bottom board: ~ 6-inch ground clearance.	Minimum of 6 strands - spaced at 9, 16, 23, 30, 38, and 46 inches above the ground.	Minimum of 3 strands (all electrified) - spaced at 18, 30, and 42 inches above the ground. Or a minimum of 4 strands (only 2 electrified) - spaced at 10, 22, 34, and 46 inches above the ground.

TABLE 1: Critical Confinement/Exclusion Livestock Fences: Recommendations for Fence Type, Height and Strand Spacing [1/]

Type of Livestock	Type of Fence				
	Woven Wire	**Barbed Wire**	**Wooden Board**	**Non-Electric High Tensile Smooth Wire**	**Electric High Tensile Smooth Wire**
Dairy Cows and Heifers	Same as above for Beef.	Same as above for Beef.	Same as above for Beef.	Same as above for Beef.	Dairy Cows only - Minimum 2 strands (2 electrified), spaced at 20 and 34 inches above the ground. With Heifers - Minimum of 3 strands (at least 2 electrified), spaced at 18, 30, and 42 inches above the ground.
Bison	Minimum of 60 inches high - fixed-knot high tensile woven wire.	Not recommended.	Not recommended.	Not recommended.	Minimum of 6 strands (at least 2 electrified) - spaced at 12, 20, 28, 36, 44, and 52 inches above the ground.
Goats and Kids **Sheep and Lambs**	Minimum of 40 inches high - 5 horizontal woven wires, plus at least one additional wire (either barbed or electrified smooth) at the top. Put the first additional wire, if barbed, no more than 3 inches above the top of the woven wire. No additional wire is required if the woven-wire fence is at least 48 inches high.	Not recommended.	Not recommended.	See Note 2 at the end of this table.	Minimum of 5 strands (at least 2 electrified) - spaced at 6, 12, 20, 28, and 36 inches above the ground. Or a minimum of 4 strands, if all are electrified.
Hogs	Minimum of 35 inches high - 5 horizontal woven wires, plus one additional wire (electrified smooth) at the bottom.	Not recommended.	Not recommended.	Not recommended.	Minimum of 5 strands (at least 2 electrified) - spaced at 6, 12, 20, 28, and 36 inches above the ground.

TABLE 1: Critical Confinement/Exclusion Livestock Fences: Recommendations for Fence Type, Height and Strand Spacing 1/					
	Type of Fence				
Type of Livestock	Woven Wire	Barbed Wire	Wooden Board	Non-Electric High Tensile Smooth Wire	Electric High Tensile Smooth Wire
Chickens/Turkeys	Minimum of 72 inches high - 2"x4" woven wires.	Not recommended.	Not recommended.	Not recommended.	Not recommended.
Emus/Ostriches	Minimum of 72 inches high - 6"x6" woven wires.	Not recommended.	Not recommended.	Not recommended.	Not recommended.

TABLE 1 NOTES:

1/ Based on the type of livestock, use the information in this table only as a guide to determine the number of strands and spacing. Adjustments to the number of strands and spacing may be made based on the fence manufacturer's recommendations and landowner's preference for critical confinement/exclusion fences.

2/ Non-electric high tensile fence is not recommended for these animals unless: (a) there are electric fences elsewhere on the farm and, as a result, the animals are trained to avoid wire fences, or (b) the fence will be used for non-critical confinement/exclusion.

TABLE 2: Non-Critical Confinement/Exclusion Livestock Fence: Recommendations for the Number of Strands and Spacing (Electric Fence)	
Type of Livestock	**Recommended Number of Strands and Spacing 1/**
Mature Horses	Permanent or temporary fencing: Minimum of 1 strand (hot) – spaced at 28 to 34 inches above the ground. High visibility strands (e.g. coated wire) are recommended for horses.
Horses and Foals	Permanent or temporary fencing: Minimum of 2 strands (both hot) – spaced at 17 to 22 inches and 32 to 38 inches above the ground. High visibility strands (e.g. coated wire) are recommended for horses.
Cows and Calves	Permanent or temporary fencing: Minimum of 2 strands (both hot) – spaced at 17 to 22 inches and 32 to 38 inches above the ground.
Mature Beef and Dairy Cattle	Permanent or temporary fencing: Minimum of 1 strand (hot) – spaced at 28 to 34 inches above the ground. For hard to hold animals, use: Permanent or temporary fencing: Minimum of 3 strands (at least 2 hot) – spaced at 10 to 17 inches, 20 to 27 inches, and 32 to 38 inches above the ground.
Bison	Permanent fencing: Minimum 4 strands (at least 2 hot) - spaced at 16, 25, 34, and 43 inches above the ground. Use high tensile smooth wire.
Goats and Kids	Permanent fencing: Minimum 3 strands (at least 2 hot) - spaced at 6, 18, and 35 inches above the ground.
Sheep and Lambs	Temporary fencing: Minimum 4 strands (all hot) - spaced at 8, 16, 24, 32 inches above the ground, or use electric net fencing a minimum of 34 inches tall.
Hogs	Permanent or temporary fencing: Minimum of 2 strands (both hot)- spaced at 10 inches and 18 inches above the ground for sows and growing-finishing pigs, or spaced at 6 inches and 18 inches above the ground for nursing pigs. Or use temporary electric net fencing a minimum of 34 inches tall.
Poultry	Temporary Fencing: Use electric net fencing a minimum of 40 inches tall.

TABLE 2 NOTES:

1/ Electric fence materials for non-critical confinement may consist of high tensile smooth wire, electroplastic twine (polywire), electrified ribbon or tape, galvanized steel braided wire, electric net fencing, or other materials as specified by the manufacturer.

Based on the type of livestock, use the information in this table as a guide to determine the number of strands and spacing. Adjustments to the number of strands and spacing may be made based on the fence manufacturer's recommendations and landowner preference for non-critical confinement/exclusion fences.

Temporary fencing may be used to provide short-term protection for streams and riparian areas but is not a long-term solution for restricting access to these and other environmentally sensitive areas.

TABLE 3: Woven Wire and Barbed Wire Fences for Critical Confinement/Exclusion

Woven wire and barbed wire fences are suitable for applications where a high level of confinement is needed, such as near roads and on property lines.

Wire – All wire shall be new ASTM Class 3 galvanized or aluminum-coated material.

For optimum strength of fencing, attach the wire to the side of the fence that will receive the greatest pressure from animals. Place wire on the outside of posts on curves and corners.

The type of wire, number of wires, spacing, and minimum height of fence is based on the type of livestock to be confined. See Table 1 for details.

Barbed wire and woven wire shall be spliced by means of a western union splice or by suitable compression sleeves applied with a tool designed for the purpose

Fence wire shall consist of one of the following materials:

1. **Woven wire** – Woven wire shall be a minimum 12½-gauge for all horizontal wires (top, bottom, and intermediate). High tensile woven wire may be used, according to manufacturer recommendations.

   Install the fencing so that the bottom wire is at ground level to exclude predators. If predators are not a concern, the bottom wire can be installed at 3 inches above ground level to facilitate maintenance. Add at least one additional wire (either barbed or electrified smooth) above the top of the woven wire. The first additional wire, if barbed, shall be no more than 3 inches above the top of the woven wire. This reduces the possibility that livestock will put their heads through the gap and push down on the woven wire fence.

   For horses, a wooden rail (board) may be used instead of, or in addition to, an electric wire at the top of the woven wire to prevent horses from stretching the fence. If a board is used without an electric wire, note in the O&M that the board will need to be replaced periodically if damaged by horses.

   Woven wire is not recommended for use in flood prone areas.

2. **Barbed wire** – Standard barbed wire shall be double-strand, a minimum 12½-gauge with 4-point barbs spaced no more than 6 inches apart or 15½-gauge for high tensile barbed wire.

   Barbed wire may be used in flood prone areas, but it is more subject to flood damage than high tensile smooth wire fence.

   Barbed wire shall not be used for horses, sheep, goats, or hogs.

Line Posts – Shall be either wooden or steel and shall meet the following criteria for type of material, size, and spacing:

1. **Wooden posts** – Shall be well seasoned or kiln-dried to minimize warping. Use untreated durable wood (e.g., red cedar, black locust, Osage orange) with bark removed, or non-durable wood that is preservative pressure treated. Do not use red pine. Treated lumber shall meet or exceed requirements for AWPA Use Category 4A (UC4A), Ground Contact, General Use.

   Wooden posts shall be at least 4 inches in diameter or 4 inches square. Wooden line posts must be of sufficient length to hold up the fence fabric, while allowing the post to be set in the ground to a minimum depth of 2½ feet. When set in depressions or low places, line posts shall be anchored in the ground or set at an angle to prevent lifting.

   Where posts cannot be set to the specified depth, they must be set in concrete to secure them. Set posts in a hole that is at least 12 inches deep, with a diameter that is at least three times the diameter of the post. (For example, a 4-inch diameter post shall have a minimum 12-inch diameter hole filled and set with concrete.) Concrete shall be of a Portland type mix and sloped at the top to provide positive drainage away from the post. Fence wire shall not be attached to posts until at least 5 days after setting the posts in concrete. Other methods for securing posts at less than the required depth may be used with prior approval from NRCS.

2. **Steel posts** – Shall be studded or punched "T", "U", or "Y" shaped with anchor plates, with a minimum weight of 1.25 lbs. per foot (excluding the anchor plate). Posts shall be either galvanized or painted. Galvanized posts shall be hot-dipped with at least 2 ounces of zinc coating per square foot. Painted posts shall be clean of loose scale with one or more coats of weather resistant paint applied.

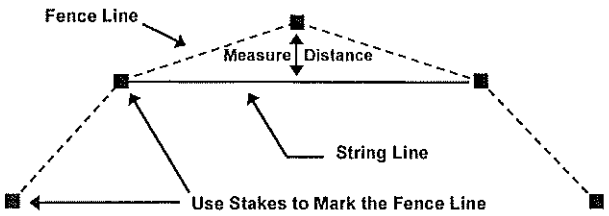
   Steel line posts shall be at least 5 feet long and driven into the ground to the top of the anchor plate. Where extra strength and support for the fence is needed, use a wooden post instead of steel for every third or fourth line-post.

TABLE 3: Woven Wire and Barbed Wire Fences for Critical Confinement/Exclusion

3. **Spacing** – For conventional woven wire fences, the maximum line post spacing is 10 feet. If high tensile woven wire is used, the maximum line post spacing shall be 20 feet or as based on the manufacturer's recommendation. For barbed wire fences, the maximum line post spacing is 16 feet.

   Line posts must be placed closer together on curves to prevent wire tension from moving the posts. Mark the location of the fence line by placing small stakes every 16 feet around the curve. Determine where the curve is greatest, and then start figuring post spacing. The sharper the curve, the closer the posts need to be.

   To determine line post spacing for barbed wire fences, set three stakes at the point of maximum curvature. String a line from the first to the third stake. Measure the distance from the center stake to the string and space the posts as shown below. Lean posts outward on the curve approximately 2 inches off vertical at the top. Posts will straighten as the wire is tightened.



Distance from Center Stake to String *Inches*	Maximum Spacing Btw. Line Posts *Feet*
7 or less	12
8 to 14	10
15 to 20	8

Determine line post spacing on curves based on the sharpness of the curve.

Corner, End, Gate, and Brace Posts – Shall be meet the following criteria for type of material and size:

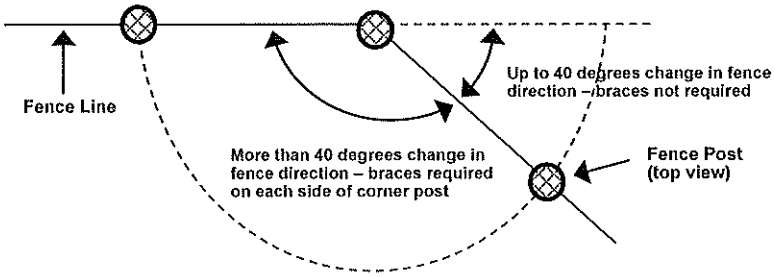
1. **Wooden posts** – Shall be well seasoned or kiln-dried to minimize warping. Use untreated durable wood (e.g., red cedar, black locust, Osage orange) with bark removed, or non-durable wood that is preservative pressure treated. Do not use red pine. Treated lumber shall meet or exceed requirements for AWPA Use Category 4A (UC4A), Ground Contact, General Use.
2. **Size** – Corner, end, and gate posts shall be at least 6 inches in diameter or 6 inches square. Brace posts shall be at least 5 inches in diameter or 5 inches square.

   Posts shall be of sufficient length to hold the fence wires while allowing the post to be set in the ground to a minimum depth of 3½ feet for corner, end, and gate brace assemblies, and a minimum depth of 2½ feet for line brace assemblies. Where posts cannot be set to the specified depth, they must be set in concrete to secure them. Set posts in a hole that is at least 24 inches deep, with a diameter that is at least three times the diameter of the post. (For example, a 6-inch diameter post shall have a minimum 18-inch diameter hole filled and set with concrete.) Concrete shall be of a Portland type mix and sloped at the top to provide positive drainage away from the post. Fence wire shall not be attached to posts until at least 5 days after setting the posts in concrete. Other methods for securing posts at less than the required depth may be used with prior approval from NRCS.
3. **Spacing** – Brace posts shall be set a minimum of 7 and a maximum of 10 feet from each corner, end, or gate post. The total length of each brace must be double the height of the fence; a double span ("double H") brace can be used to add length. Brace assemblies shall be installed as described in the next section of this table.

TABLE 3: Woven Wire and Barbed Wire Fences for Critical Confinement/Exclusion

Brace Assemblies – **Single span or double span brace assemblies** are required at all corners, ends, and gates, and where the fence alignment changes direction by more than 40 degrees (see diagram below). **Line brace assemblies** shall also be installed at appropriate intervals in a run of fence and at sharp breaks in grade. A ***run*** is the distance between a corner, end, or gate post and the next corner, end, or gate post. Types and maximum intervals for bracing shall be as shown below.

Type of Fence	Run of Fence between Corner, End, and/or Gate Posts	Type of Brace Assembly Needed at Corner, End, and/or Gate Posts	Line Brace Assembly Interval in the Run of Fence
Woven wire or barbed wire	Less than 700 feet.	The total length of each brace must be double the height of the fence; a double span ("double H") brace can be used to add length.	Line braces are not required at fixed intervals for this run of fence. Use as needed at bottom of hills.
	More than 700 feet.		At least one every 700 feet in the run of the fence and as needed on the bottoms of hills.



Determine the need for corner braces based on the degree of change in fence direction.

Horizontal brace rails shall be installed roughly ¾ of the way up the vertical posts and shall consist of one of the following materials:

1. **Galvanized steel pipe** – Minimum 7 feet long, 2-inch diameter, with minimum wall thickness as specified for a water supply pipe.
2. **Wooden post** – Minimum 7 feet long, 4-inch square or 4-inch diameter round.

Brace post pins shall be galvanized steel rods a minimum of 5/16-inch x 9-inch and 5/16-inch x 4-inch.

Brace wires shall consist of 12½ gauge or stronger, galvanized, high tensile wire, double wrapped in a figure 8 pattern, with an in-line strainer. Brace wires shall be tightened to secure the brace assemblies.

If a wide stream or gully (i.e. greater than 16 feet) is to be crossed, the fence section shall be terminated on one bank with a brace assembly and a new section started on the other bank.

TABLE 3: Woven Wire and Barbed Wire Fences for Critical Confinement/Exclusion
Fasteners – For wood posts, use minimum 9-gauge galvanized wire staples to attach wire to the posts. Staples shall be a minimum of 1¼ inches long for softwood and a minimum of 1 inch long for hardwood such as black locust. Staples shall be driven diagonally across the wood grain to avoid splitting. For high tensile fencing material, the staples shall not be driven into the posts (including line, corner, end, gate, and brace posts) so deeply that the wire will not move when tightened or with expansion and contraction. For steel line posts, attach wires by wrapping with 12½ to 14-gauge galvanized wire or by use of the manufacturer's specially designed clips.
Grounding Rods – Non-electrified metal fences shall be grounded at least every 1,000 feet to protect livestock from lightning strikes. Fences built with metal posts set in the earth will provide sufficient lightning protection and do not require additional grounding.

TABLE 4: Wooden Board Fence for Critical Confinement/Exclusion

Board fences are suitable for applications where a high level of confinement or exclusion is needed, such as near roads and on property lines.

Wooden boards (horizontal rails) and posts shall be well seasoned or kiln-dried to minimize warping. Use untreated durable wood (e.g., red cedar, black locust, Osage orange) with bark removed, or a non-durable wood that is preservative pressure treated. Treated lumber for boards shall meet or exceed requirements for AWPA Use Category 3B (UC3B), Above Ground, Exposed Use; posts shall meet or exceed requirements for AWPA Use Category 4A (UC4A), Ground Contact, General Use. Boards and posts may be painted if desired.

For optimum strength of fencing, attach the boards to the side of the fence that will receive the greatest pressure from animals. Where appearance is important, the boards may be placed on the outside of the fence.

The number of boards, board spacing, and minimum height of fence is based on the type of livestock to be confined. See Table 1 for details.

Posts – Shall meet the following criteria for size, installation, and spacing:

1. **Size** – Line posts shall be at least 4 inches in diameter or 4 inches square, be of sufficient length to support the height of the fence, and be firmly set or driven in the ground a minimum of 2½ feet.

   Corner, gate and end posts shall be at least 6 inches in diameter or 6 inches square, be of sufficient length to support the height of the fence, and be firmly set or driven in the ground a minimum of 3 feet.

   Where posts cannot be set to the specified depth, they must be set in concrete to secure them. Set posts in a hole that is at least 24 inches deep, with a diameter that is at least three times the diameter of the post. (For example, a 6-inch diameter post shall have a minimum 18-inch diameter hole filled and set with concrete.) Concrete shall be of a Portland type mix and sloped at the top to provide positive drainage away from the post. Fence rails shall not be attached to posts until at least 5 days after setting the posts in concrete. Other methods for securing posts at less than the required depth may be used with prior NRCS approval.

2. **Spacing** – Posts shall be spaced a maximum of 8 feet on center to accommodate rail lengths of a maximum of 16 feet.

Rails – The rails (horizontal boards) shall be a nominal minimum of 1 inch thick x 6 inches wide. Board lengths of 16 feet are preferred in order to stagger the unions when placed on posts on 8-foot centers.

Nails – Each board shall be attached to the post with a minimum of two 12d (3 1/4-inch) galvanized nails. For better holding power, use ring-shank or screw-shank instead of common nails. Two 3-inch decking screws may be used instead of nails.

TABLE 5: Chain Link Fence for Critical Confinement/Exclusion

Chain link fences are suitable for applications where a high level of confinement or exclusion is needed, such as near roads, on property lines, or adjacent to hazardous areas.

Chain Link Wire Fabric – Shall be a minimum 5 feet high, 9-gauge wire, standard 2-inch chain link diamond mesh, with a minimum tensile strength of 1,290 lbs. Chain link fence fabric shall conform to the requirements of ASTM A 392, "Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric," 2-inch woven mesh, and 9-gauge galvanized steel wire. Zinc coating shall be Class 2 (i.e., 2 ounces of zinc coating per square foot).

Steel Pipes – Posts and fence framework shall conform to the requirements of ASTM F 669, "Specification for Strength Requirements of Metal Posts and Rails for Industrial Chain Link Fence," Group 1A (Schedule 40); ASTM F 1043 "Standard Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework," Group 1A; and ASTM F 1083, "Standard Specification for Pipe, Steel, Hot Dipped Zinc Coated (Galvanized) Welded, for Fence Structures," as applicable. Coatings shall be Type A galvanized for both internal and external surfaces.

1. **Line posts** – Shall be a minimum 1.90 inches Outside Diameter standard round (Schedule 40) steel pipe, with a minimum weight of 2.72 lbs./lin. ft. (or 2.28 lbs./lin. ft. for Grade B High Strength Steel). Posts shall be of sufficient length to support the height of the fence, and be set in concrete to a minimum depth of 2 feet;
2. **Top and brace rails** – Shall be a minimum 1.66 inches Outside Diameter standard round (Schedule 40) steel pipe, with a minimum weight of 2.27 lbs./lin. ft. (or 1.84 lbs./lin. ft. for Grade B High Strength Steel);
3. **Terminal posts** – Shall be a minimum 2.375 inches Outside Diameter standard round (Schedule 40) steel pipe, with a minimum weight of 3.65 lbs./lin. ft. (or 3.12 lbs./lin. ft. for Grade B High Strength Steel). Posts shall be of sufficient length to support the height of the fence and be set in concrete to a minimum depth of 2 feet.

Fittings and Gates – Fence fittings shall conform to the requirements of ASTM F 626, "Standard Specification for Fence Fittings." Fittings shall be galvanized steel. Wire ties and clips shall be 9-gauge.

Gates, gate posts, and gate accessories shall conform to the requirements of ASTM F 900, "Standard Specification for Industrial and Commercial Swing Gates." Coating shall be the same as selected for adjoining fence and framework.

1. **Gate posts** – Shall be a minimum 2.875 inches Outside Diameter standard round (Schedule 40) steel pipe, with a minimum weight of 5.79 lbs./lin. ft. (or 4.64 lbs./lin. ft. for Grade B High Strength Steel). Posts shall be of sufficient length to support the height of the fence, and be set in concrete to a minimum depth of 2 feet and a width at least 3 times the diameter of the pipe;
2. **Gate frame members** – Shall be a minimum 1.66 inches Outside Diameter standard round (Schedule 40) steel pipe, with a minimum weight of 2.27 lbs./lin. ft. (or 1.84 lbs./lin. ft. for Grade B High Strength Steel).

Installation – Unless otherwise specified by the manufacturer, line posts shall be set at intervals not exceeding 10 feet, as measured from center to center of each post.

All posts shall be installed vertically. Where posts are installed on an inclined surface, the angle of the post shall be adjusted so that the post will be vertical.

All posts shall be capped immediately after installation.

Chain link fabric is generally installed on the outside of the fence post. The fabric shall not be attached to posts until at least 3 days after the posts are set in concrete walls, or at least 5 days after posts are set in the ground with concrete backfill. The fabric shall be stretched taut and securely fastened, using 9-gauge tie clips, to posts at intervals not exceeding 15 inches and to top rails or tension wires at intervals not exceeding 2 feet. Care shall be taken to equalize the tension on each side of each post.

Gate frames shall be fabricated and hung so that they sag no more than 1% of the gate width.

TABLE 6: High Tensile Smooth Wire for Critical Confinement/Exclusion Fences and Non-Critical Confinement/Exclusion (or Divisional) Fences

High tensile fencing (**electrified or non-electrified**) is suitable for applications where a high level of confinement is needed, such as near roads and on property lines. It may also be used for interior or divisional fences to divide large pasture acreage into manageable units, to divide the paddocks of intensive grazing systems, or for other non-critical applications.

Wire – All wire shall be ASTM Class 3 galvanized. Wire may also be poly-coated for improved visibility and livestock safety.

For critical confinement, use 12½ gauge minimum with at least 200,000 PSI tensile strength and at least 1,000 pounds breaking strength. For non-critical confinement, use a minimum of 17 gauge.

For optimum strength of fencing, attach the wire to the side of the fence that will receive the greatest pressure from animals. Place wire on the outside of posts on curves and corners.

Wire shall be tight enough that it does not sag. Tension shall be set with in-line wire strainers and/or tension indicator springs.

Tension springs are recommended for use in the top one to two strands in areas where the fence is near trees or where animal pressure will be heavy. Tension springs may also be used for all strands.

Wrap and twist wires or use crimping sleeves on end and gate posts. At self-insulating corner posts, wrap and twist a separate wire to form an 18 to 20-inch loop to support fence strands, or use a wrap-around insulator. Wire clips used to hold wire in batten slots should allow the wire to slide freely.

The number of wires and spacing is based on the type of livestock to be confined and the purpose and location of the fence. See Tables 1 and 2 for details. In flood prone areas, use no more than six strands of high tensile wire. There is a greater possibility of flood damage if more strands are used.

Line Posts – Shall be either wooden or steel and shall meet the following criteria for type of material, size, and spacing:

1. **Wooden posts** – Shall be well seasoned or kiln-dried to minimize warping. Use untreated durable wood (e.g., red cedar, black locust, Osage orange) with bark removed, or non-durable wood that is preservative pressure treated. Do not use red pine. Treated lumber shall meet or exceed requirements for AWPA Use Category 4A (UC4A), Ground Contact, General Use.

   Wooden posts shall be at least 4 inches in diameter or 4 inches square.

   Wooden line posts must be of sufficient length to hold up the fence fabric while allowing the post to be set in the ground to a minimum depth of 2½ feet. When set in depressions or low places, line posts shall be anchored in the ground or set at an angle to prevent lifting.

   Where posts cannot be set to the specified depth, they must be set in concrete to secure them. Set posts in a hole that is at least 24 inches deep, with a diameter that is at least three times the diameter of the post. (For example, a 4-inch diameter post shall have a minimum 12-inch diameter hole filled and set with concrete.) Concrete shall be of a Portland type mix and sloped at the top to provide positive drainage away from the post. Fence wire shall not be attached to posts until at least 5 days after setting the posts in concrete. Other methods for securing a post at less than the required depth may be used with prior approval from NRCS.

2. **Steel posts** – Shall be studded or punched "T", "U", or "Y" shaped with anchor plates, with a minimum weight of 1.25 lbs. per foot (excluding the anchor plate). Posts shall be either galvanized or painted. Galvanized posts shall be hot-dipped with at least 2 ounces of zinc coating per square foot. Painted posts shall be clean of loose scale with one or more coats of weather resistant paint applied.

   Steel line posts shall be at least 5 feet long and driven into the ground to the top of the anchor plate.

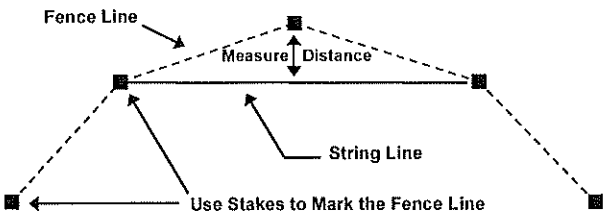
   Where extra strength and support for the fence is needed, use a wooden post instead of steel for every third or fourth line post.

3. **Spacing** – Line posts shall be spaced a maximum of 60 feet apart, on center, on smooth, level terrain, or maximum of 90 feet with battens installed at 30 and 60 feet. Reduce the spacing between posts on uneven ground or rolling terrain and to maintain spacing of the bottom wire above the ground.

TABLE 6: High Tensile Smooth Wire for Critical Confinement/Exclusion Fences and Non-Critical Confinement/Exclusion (or Divisional) Fences

Line posts must be placed closer together on curves to prevent wire tension from moving the posts. Mark the location of the fence line by placing small stakes every 16 feet around the curve. Determine where the curve is greatest, and then start figuring post spacing. The sharper the curve, the closer the posts need to be.

Select three stakes at the point of maximum curvature. String a line from the first to the third stake. Measure the distance from the center stake to the string and space the posts as shown below. Lean posts outward on the curve approximately 2 inches off vertical at the top. Posts will straighten as the wire is tightened.



Distance from Center Stake to String *Inches*	Maximum Spacing Btw. Line Posts *Feet*
7 or less	12
8 to 14	10
15 to 20	8

Determine line post spacing on curves based on the sharpness of the curve.

Battens – If battens are used, distances between line posts can be increased by 30 feet. Battens shall be 1¼-inch x 1¼-inch x 3½ feet long, self-insulating pressure treated softwood, slotted hardwood, light duty fiberglass, or other NRCS approved material.

Spacing between battens will be 30 feet maximum.

For a one-strand fence, use 4-foot (minimum height) wood or insulated steel posts instead of battens.

Corner, End, Gate, and Brace Posts – Shall be meet the following criteria for type of material and size:

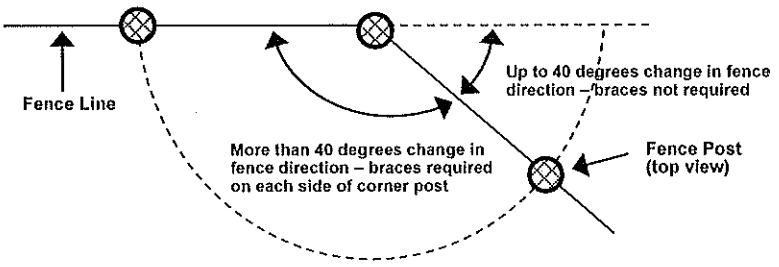
1. **Wooden posts** – Shall be well seasoned or kiln-dried to minimize warping. Use untreated durable wood (e.g., red cedar, black locust, Osage orange) with bark removed, or non-durable wood that is preservative pressure treated. Do not use red pine. Treated lumber shall meet or exceed requirements for AWPA Use Category 4A (UC4A), Ground Contact, General Use.
2. **Size** – Corner, end, and gate posts shall be at least 6 inches in diameter or 6 inches square. Brace posts shall be at least 5 inches in diameter or 5 inches square.

   Posts shall be of sufficient length to hold the fence wires while allowing the post to be set in the ground to a minimum depth of 3½ feet for corner, end, and gate brace assemblies, and a minimum depth of 2½ feet for line brace assemblies. Where posts cannot be set to the specified depth, they must be set in concrete to secure them. Set posts in a hole that is at least 24 inches deep, with a diameter that is at least three times the diameter of the post. (For example, a 6-inch diameter post shall have a minimum 18-inch diameter hole filled and set with concrete.) Concrete shall be of a Portland type mix and sloped at the top to provide positive drainage away from the post. Fence wire shall not be attached to posts until at least 5 days after setting the posts in concrete. Other methods for securing posts at less than the required depth may be used with prior approval from NRCS.
3. **Spacing** – Brace posts shall be set a minimum of 7 and a maximum of 10 feet from each corner, end, or gate post. The total length of each brace must be double the height of the fence; a double span ("double H") brace can be used to add length. Brace assemblies shall be installed as described in the next section of this table.

TABLE 6: High Tensile Smooth Wire for Critical Confinement/Exclusion Fences and Non-Critical Confinement/Exclusion (or Divisional) Fences

Brace Assemblies – For fences with 3 or more strands of high tensile wire, **single span or double span brace assemblies** are required at all corners, ends, and gates, and where the fence alignment changes direction by more than 40 degrees (see diagram, next page). **Line brace assemblies** shall also be installed at appropriate intervals in a run of fence and at sharp breaks in grade. A *run* is the distance between a corner, end, or gate post and the next corner, end, or gate post. Types and maximum intervals for bracing shall be as shown below. For fences with fewer than 3 strands, braces are not required if alternatives to braces (such as closer line post spacing and angled end posts) will provide sufficient support for the fence.

Type of Fence	Run of Fence between Corner, End, and/or Gate Posts	Type of Brace Assembly Needed at Corner, End, and/or Gate Posts	Line Brace Assembly Interval in the Run of Fence
High-tensile, *5 or more strands.*	Less than 1,300 feet.	The total length of each brace must be double the height of the fence; a double span ("double H") brace can be used to add length. Use double span braces if fence has 6 or more strands.	Line braces are not required at fixed intervals for this run of fence. Use as needed at bottom of hills.
	More than 1,300 feet.		At least one every 1,300 feet in the run of the fence and as needed on the bottoms of hills.
High-tensile, *3 or 4 strands.*	Less than 1,700 feet.	The total length of each brace must be double the height of the fence; a double span ("double H") brace can be used to add length.	Line braces are not required at fixed intervals for this run of fence. Use as needed at bottom of hills.
	More than 1,700 feet.		At least one every 1,700 feet in the run of the fence and as needed on the bottoms of hills.



For fences with 3 or more strands of high tensile wire, determine the need for corner braces based on the degree of change in fence direction.

TABLE 6: High Tensile Smooth Wire for Critical Confinement/Exclusion Fences and Non-Critical Confinement/Exclusion (or Divisional) Fences
Horizontal brace rails shall be installed roughly ¾ of the way up the vertical posts and shall consist of one of the following materials: 1. **Galvanized steel pipe** – Minimum 7 feet long, 2-inch diameter, with minimum wall thickness as specified for a water supply pipe; 2. **Wooden post** – Minimum 7 feet long, 4-inch square or 4-inch diameter round. **Brace post pins** shall be galvanized steel rods a minimum of 5/16-inch x 9-inch and 5/16-inch x 4-inch. **Brace wires** shall consist of 12½ gauge or stronger, galvanized, high tensile wire, double wrapped in a figure 8 pattern, with an in-line strainer. Brace wires shall be tightened to secure the brace assemblies. If a wide stream or gully (i.e. greater than 16 feet) is to be crossed, the fence section shall be terminated on one bank with a brace assembly and a new section started on the other bank.
Fasteners – For wood posts, use minimum 9-gauge galvanized wire staples to attach wire to the posts. Staples shall be a minimum of 1¼ inches long for softwood and a minimum of 1 inch long for hardwood such as black locust. Staples shall be driven diagonally across the wood grain to avoid splitting. Staples shall not be driven into the post so deeply (including line, corner, end, gate, and brace post) that the wire will not move when tightened or with expansion and contraction. For steel line posts, attach wires by wrapping with 12½ to 14-gauge galvanized wire or by use of the manufacturer's specially designed clips. All electrified wires must be properly insulated as specified by the fence manufacturer.
Electrical Fence Charger – An electric fence charger (energizer) must have adequate voltage to effectively electrify the system and maintain output to control the type of animals, based on the manufacturer's recommendations. A minimum of two kilovolts on each electrified strand is acceptable for most classes of livestock. The charger shall be low impedance, UL approved or equivalent, and shall include all of the safety features that are required by the manufacturer.
Insulators – If needed, these shall be UV stabilized (plastic) high density polypropylene Type W or type S, high strain end and corner tube insulator, or high strain porcelain corner Type O. Insulators shall be strong enough to support long spans of wire and must allow the wire to slide freely. Insulators shall be used on all posts that are not self-insulating. Do not use aluminum nails or screws on pressure treated posts
Grounding Rods – Rods shall meet or exceed the requirements of the manufacturer of the electrical fence charger and shall be installed as per the manufacturer's recommendations.

TABLE 7: Electroplastic Twine (Polywire), Electrified Ribbon, and Galvanized Steel Braided Wire for Non-Critical Confinement/Exclusion (or Divisional) Fences
Electrified twine, ribbon type fencing, and/or galvanized steel braided wire may be used as interior (cross) fencing to divide large pasture acreage into manageable units, to divide the paddocks of intensive grazing systems, swath or bale grazing, or similar applications. Electric net fencing, which includes built-in portable posts, may also be suitable for some livestock and poultry applications. Lightweight type fencing shall not be used alone where a high level of confinement is needed. ***Wire*** – Shall consist of new materials free of manufacturing or other defects. Polywire shall have a minimum of seven stainless steel strands running through the fabric. The number of wires and spacing is based on the type of animal to be confined. See Table 2 for details.
Line Posts – Shall be manufactured fiberglass, plastic, or other suitable material as approved by NRCS. Posts shall be at least 4 feet long and set deep enough in the ground to withstand livestock. "Step-in" posts designed for this purpose may be used for portable fencing. These posts include a flange or stirrup near the bottom of the post for pressing the post into the ground. Line posts shall be installed on a spacing as specified by the manufacturer to control specific livestock. Closer spacing shall be used as topographic conditions indicate.
Corner and End Posts – When posts are needed at the end or corner of a cross fence, they may be untreated durable wood (e.g., red cedar, black locust, Osage orange), or non-durable wood that is preservative pressure treated. Do not use red pine. Treated lumber shall meet or exceed requirements for AWPA Use Category 4A (UC4A), Ground Contact, General Use. Posts must have a diameter sufficient to anchor the wire and be long enough to allow them to be set at least 1½ feet in the ground.
Fasteners – The fence shall be fastened and insulated from line and end posts by using supplies provided by the manufacturer of the fence material.
Electrical Fence Charger – An electric fence charger (energizer) must have adequate voltage to effectively electrify the system and maintain output to control the type of animals, based on the manufacturer's recommendations. A minimum of two kilovolts on each electrified strand is acceptable for most classes of livestock. The charger shall be low impedance, UL approved or equivalent, and shall include all of the safety features that are required by the manufacturer.
Grounding Rods – Rods shall meet or exceed the requirements of the manufacturer of the electrical fence charger and shall be installed as per the manufacturer's recommendations.

TABLE 8: Summary of Fence Types and Selected Materials [1/]

Type of Fence	Fence Materials and Installation Requirements							
	Wire Quality	**Line Post Type**	**Line Post Size**	**Line Post Spacing**	**Corner, End, Gate, and Brace Post Type**	**Corner, End, & Gate Post Size**	**Brace Post Size**	**Additional Brace Requirements**
Woven Wire	ASTM Class 3 galvanized, min. 12½-gauge horizontal wires with min. 14-gauge vertical wire.	Untreated durable wood (e.g., red cedar, black locust, Osage orange) with bark removed, or Non-durable wood that is preservative pressure treated (UC4A, Ground Contact, General Use), or Heavy duty steel "T", "U", or "Y" posts, galvanized or painted, with anchor plates.	Wooden posts: min. 4 inches diameter or 4 inches square. Set in ground to min. depth of 2½ feet. (See Note 2 at the end of this table.) Steel posts: min. 5 feet long. Drive into the ground to the top of the anchor plate.	Max. 10 feet apart, on center, for standard wire. Max 20 feet apart, on center, if high tensile wire.	Untreated durable wood (e.g., red cedar, black locust, Osage orange) with bark removed, or Non-durable wood that is preservative pressure treated (UC4A, Ground Contact, General Use).	Min. 6 inches diameter or 6 inches square. Set in ground to min. depth of 3½ feet. (See Note 2 at the end of this table.)	Min. 5 inches diameter or 5 inches square. Set in ground to min. depth of 3½ feet with corner, end, and gate brace assemblies, and a min. depth of 2½ feet with line brace assemblies. (See Note 2 at the end of this table.)	Length of braces must be double the height of the fence; use double span braces as needed to add length. Use line braces at bottom of hills and to divide fence lengths where runs of fence are more than 700 feet long.
Barbed Wire	ASTM Class 3 galvanized, double-strand, min. 12½-gauge with 4-point barbs spaced no more than 6 inches apart, or 15½-gauge for high tensile.	Same as above.	Same as above.	Max. 16 feet apart, on center.	Same as above.	Same as above.	Same as above.	Same as above.

TABLE 8: Summary of Fence Types and Selected Materials [1/]

Type of Fence	Fence Materials and Installation Requirements							
	Wire Quality	**Line Post Type**	**Line Post Size**	**Line Post Spacing**	**Corner, End, Gate, and Brace Post Type**	**Corner, End, & Gate Post Size**	**Brace Post Size**	**Additional Brace Requirements**
Wooden Board	Wood rails (boards) – untreated durable wood, (e.g., red cedar, black locust, Osage orange), well-seasoned or kiln-dried. Min. 1 inch thick x 6 inches wide, and at least 8 feet long. Non-durable wood must be preservative pressure treated (UC3B, Above Ground, Exposed Use).	Untreated durable wood (e.g., red cedar, black locust, Osage orange) with bark removed, or Non-durable wood that is preservative pressure treated (UC4A, Ground Contact, General Use).	Wooden posts min. 4 inches diameter or 4 inches square. Length sufficient to support desired height of fence and be set in the ground a min. of 2½ feet deep. (See Note 2 at the end of this table.)	Max. 8 feet apart, on center.	Untreated durable wood (e.g., red cedar, black locust, Osage orange) with bark removed, or Non-durable wood that is preservative pressure treated (UC4A, Ground Contact, General Use).	Wooden posts min. 6 inches diameter or 6 inches square. Length sufficient to support desired height of fence and be set in ground to min. depth of 3 feet. (See Note 2 at the end of this table.)	Not applicable.	Not applicable.
Chain Link	Min. 9-gauge galvanized wire with 2 ounces of zinc coating per sq. ft. Minimum tensile strength of 1,290 lbs., 2-inch woven mesh.	Steel post, galvanized with 2 ounces of zinc coating per sq. ft., or painted.	Minimum 1.90 inches Outside Diameter standard round (Schedule 40) steel pipe. Posts shall be of sufficient length to support the height of the fence and be set in concrete to a minimum depth of 2 feet.	Max. 10 feet apart, on center.	Steel post, galvanized with 2 ounces of zinc coating per sq. ft., or painted.	End (terminal) posts – Minimum 2.375 Outside Diameter standard round (Schedule 40) steel pipe. Gate posts – Minimum 2.875 Outside Diameter standard round (Schedule 40) steel pipe. Posts shall be of sufficient length to support the height of the fence and be set in concrete to a minimum depth of 2 feet.	Not applicable.	Not applicable.

TABLE 8: Summary of Fence Types and Selected Materials [1/]

Type of Fence	Fence Materials and Installation Requirements							
	Wire Quality	**Line Post Type**	**Line Post Size**	**Line Post Spacing**	**Corner, End, Gate, and Brace Post Type**	**Corner, End, & Gate Post Size**	**Brace Post Size**	**Additional Brace Requirements**
High Tensile Smooth Wire ***(5 strands or more)***	ASTM Class 3 galvanized, min. 12½-gauge 200,000 PSI, 1,000 lbs. breaking strength.	Untreated durable wood (e.g., red cedar, black locust, Osage orange) with bark removed, or Non-durable wood that is preservative pressure treated (UC4A, Ground Contact, General Use), or Heavy duty steel "T", "U", or "Y" posts, galvanized or painted, with anchor plates.	Wooden posts: min. 4 inches diameter or 4 inches square. Set in ground to min. depth of 2½ feet. (See Note 2, below.) Steel posts: min. 5 feet long. Drive into the ground to the top of the anchor plate.	Max. 60 feet apart, on center, or Max. 90 feet apart, on center, with battens installed at 30 and 60 feet.	Untreated durable wood (e.g., red cedar, black locust, Osage orange) with bark removed, or Non-durable wood that is preservative pressure treated (UC4A, Ground Contact, General Use).	Min. 6 inches diameter or 6 inches square. Set in ground to min. depth of 3½ feet. (See Note 2 at the end of this table.)	Min. 5 inches diameter or 5 inches square. Set in ground to min. depth of 3½ feet with corner, end, and gate brace assemblies, and a min. depth of 2½ feet with line brace assemblies. (See Note 2 at the end of this table.)	Length of braces must be double the height of the fence; use double span braces as needed to add length. Use double span braces if 6 or more strands. Use line braces at bottom of hills and to divide fence lengths where runs of fence are more than 1,300 feet long.
High Tensile Smooth Wire ***(4 strands or fewer)***	ASTM Class 3 galvanized, min. 12½-gauge 200,000 PSI, 1,000 lbs. breaking strength.	Untreated durable wood (e.g., red cedar, black locust, Osage orange) with bark removed, or Non-durable wood that is preservative pressure treated (UC4A, Ground Contact, General Use), or Heavy duty steel "T", "U", or "Y" posts, galvanized or painted, with anchor plates.	Wooden posts: min. 4 inches diameter or 4 inches square. Set in ground to min. depth of 2½ feet. (See Note 2, below.) Steel posts: min. 5 feet long. Drive into the ground to the top of the anchor plate.	Max. 60 feet apart, on center, or Max. 90 feet apart, on center, with battens installed at 30 and 60 feet.	Untreated durable wood (e.g., red cedar, black locust, Osage orange) with bark removed, or Non-durable wood that is preservative pressure treated (UC4A, Ground Contact, General Use).	Min. 6 inches diameter or 6 inches square. Set in ground to min. depth of 3½ feet. (See Note 2 at the end of this table.)	Min. 5 inches diameter or 5 inches square. Set in ground to min. depth of 3½ feet with corner, end, and gate brace assemblies, and a min. depth of 2½ feet with line brace assemblies. (See Note 2 at the end of this table.)	Length of braces must be double the height of the fence; use double span braces as needed to add length. For 3-4 strand fences, use line braces at bottom of hills and to divide fence lengths where runs of fence are more than 1,700 feet long.

TABLE 8: Summary of Fence Types and Selected Materials 1/								
	Fence Materials and Installation Requirements							
Type of Fence	Wire Quality	Line Post Type	Line Post Size	Line Post Spacing	Corner, End, Gate, and Brace Post Type	Corner, End, & Gate Post Size	Brace Post Size	Additional Brace Requirements
Electroplastic Twine (Polywire), Electrified Ribbon, and Galvanized Steel Braided Wire	Polywire: min. 7 stainless steel strands running through the fabric.	Fiberglass, plastic, or other suitable material as approved by NRCS.	Min. 4 feet long, set deep enough in the ground to withstand livestock. Can use "step-in" posts for portable fencing.	Use spacing specified by the manufacturer to control livestock.	Untreated durable wood (e.g., red cedar, black locust, Osage orange) with bark removed, or Non-durable wood that is preservative pressure treated (UC4A, Ground Contact, General Use).	Diameter sufficient to anchor the wire. Posts must be long enough to allow them to be set at least 1½ feet in the ground. (See Note 2, below.)	Not applicable.	Not applicable.

TABLE 8 NOTES:

1/ This table briefly summarizes some of the major components (primarily wood and steel) and installation requirements for each fence type. Refer to Tables 1 – 7 for more detailed criteria. Other materials may also be used if approved in advance by NRCS.

2/ Where posts cannot be set to the specified depth, they must be set in concrete to secure them. Set posts in a hole that is at least 12 inches deep, with a diameter that is at least three times the diameter of the post. (For example, a 4-inch diameter post shall have a minimum 12-inch diameter hole filled and set with concrete.) Concrete shall be of a Portland type mix and sloped at the top to provide positive drainage away from the post.

NATURAL RESOURCES CONSERVATION SERVICE
PRACTICE SPECIFICATION
LINED WATERWAY OR CONVEYANCE CHANNEL
(Code 468)

1. SCOPE

The work shall consist of furnishing materials and installing all components of the lined waterway or conveyance channel, as outlined in this specification and the drawings.

Construction work covered by this specification shall not be performed between December 1 and the following March 15, unless the site conditions and/or construction methods to be used have been reviewed and approved by the Engineer.

2. MATERIALS

All materials used shall conform to the quality and grade noted on the drawings, set forth in Section 6, or as otherwise listed below:

a. ROCK shall be durable and obtained from sources listed in Penn DOT Bulletin 14 or as otherwise approved by the designer. Gradation shall be as specified in Section 6 or on the drawings. The nominal size of a rock is that dimension (middle) which passes through a square opening with the same dimension; i.e., it is not the greatest dimension. The rock shall be free from soil and trash. Rocks shall be angular or sub- angular in shape. However, the least dimension of any individual rock shall be greater than one-third the greatest dimension. Unless specified in Section 6, a gradation quality control check shall be made of the in-place riprap by the Contractor. Any dispute on the acceptability of the gradation shall be resolved by physically testing the riprap in question. The Contractor is to provide the equipment and labor necessary to perform the testing at no additional cost.

b. EARTH FILL material used in constructing the waterway shall be obtained from the waterway area or other approved sources. Fill shall contain no frozen material, rocks greater than 6 inches in diameter, roots or wood greater than 2 inches in diameter or 4 inches in length, sod, brush, or other objectionable material.

c. DRAINFILL AGGREGATE shall meet the requirements of Penn DOT Specifications, Section 703.2, Type A, Coarse Aggregate. The size and gradation shall be as specified in Section 6 or on the drawings.

d. CONCRETE, masonry, or pre-cast concrete shall be made in conformance with the requirements of Penn DOT Specifications, Sections 704, 713, and 714, as appropriate.

e. GEOTEXTILE shall meet the requirements as outlined in NRCS Design Note 24 and NRCS Material Specification 592 or as otherwise stated in the design and specifications. Certification from the manufacturer shall be provided by the Contractor that the geotextile meets these requirements.

f. SYNTHETIC TURF REINFORCEMENT FABRICS shall meet the requirements of Penn DOT Specifications, Section 806.2(b) and (c), unless otherwise set forth in Section 6.

g. GRID PAVERS shall meet the requirements of Penn DOT Specifications, Section 857.

3. SITE PREPARATION

The foundation area shall be cleared of trees, stumps, roots, sod, loose rock, and other material. The waterway cross section shall be excavated to the neat lines and grades as shown on the drawings. The sub-grade surface on which the lining is to be installed shall be excavated or filled as needed. Fill shall be compacted to approximately the same density as the adjacent undisturbed material. No abrupt deviations from the design grade or horizontal alignment shall be permitted.

All material removed by the clearing and grubbing operation shall be disposed of as directed by the Owner or his/her Representative, or as set forth in Section 6.

Areas adjacent to the waterway shall be graded to allow water to drain directly into the waterway.

4. FILTER OR BEDDING

Where a geotextile fabric is required under the lining, it shall be unrolled in a direction parallel to the waterway in a loose manner permitting it to conform to the surface, without damage, when the lining is placed. The fabric shall be secured and overlapped as per the manufacturer's recommendations for waterway applications. Fabric ends shall be trenched, as necessary, to ensure that drainage from adjacent areas does not get under the fabric. Placement of fabric on mud, un-compacted fill or frozen material will not be permitted.

Prior to the placement of the lining material, the fabric shall be inspected and approved by the designated inspector. Notification shall be given far enough in advance to provide time to schedule the inspection. Any fabric which is damaged during placement of the lining material shall be replaced.

Aggregate bedding shall be placed to the thickness shown on the drawings, or as set forth in Section 6. Compaction of the bedding material is not required; however, the surface of the material shall be reasonably smooth and free of mounds or windrows.

5. LINING PLACEMENT

Rock linings shall be placed by equipment to the thickness specified. The rock shall be installed to the full thickness in one operation, and in such a manner as to avoid serious displacement or damage to the underlying materials or adjacent structures. In no case shall rock be dropped from a height greater than 3 feet.

The rock shall be delivered and placed in such a manner that will ensure that the in- place lining is homogeneous with no one size dominating an area. Some hand placing may be necessary to provide a neat and uniform surface on grade. Rock shall be placed so as not to obstruct or divert drainage from areas adjacent to the waterway sides.

Concrete linings shall be placed to the thickness shown on the drawings. The surface shall be smooth and even with concrete paste worked to the surface to fill all voids.
Careful screeding (striking-off) and/or wood float finishing shall be required, unless otherwise shown on the drawings, or as set forth in Section 6. Adequate precautions shall be taken to protect freshly placed concrete from freezing or extremely high temperatures, to insure proper curing.

Other pavement or linings, such as synthetic turf reinforcement fabrics, grid pavers, etc., shall be installed in accordance with Penn DOT Specifications, Sections 806 and 857, as appropriate, and/or as otherwise set forth in Section 6.

6. ADDITIONAL CONDITIONS WHICH APPLY TO THE PROJECT ARE:

USDA United States Department of Agriculture

Natural Resources Conservation Service
Practice Specification
Livestock Pipeline (Code 516)

1. SCOPE

The work shall consist of furnishing materials and installing all components of a pipeline, as outlined in this specification and the drawings.

2. MATERIALS

All materials used shall conform to the quality and grade noted on the plans, set forth in Section 5, or as otherwise listed below:

PIPE

If the plastic pipe is stored on site, it should be protected from sunlight.

Pipe and fittings shall meet the requirements of one of the following types and standards, or as described in NRCS NEH Part 636 Chapter 52, or as otherwise set forth in Section 5 or on the drawings.

1. Steel Pipe. AWWA standard C200; ASTM standards A53, A134, A135 and A139, A858, and A865.
2. Ductile Iron. AWWA standard C600; and ASTM standard A746.
3. Aluminum (Tubing). ASTM standards B210, B241, and B313; ANSI standards H35.1 and H35.2.
4. Corrugated Metal. ASTM standards A760 and B745; AASHTO standards M36, M196, and M245. Pipe bands or couplers shall meet the requirements of the applicable pipe specification, except that channel bands (for use with flanged pipe), smooth or flat bands, nor dimple bands shall be allowed.
5. Polyvinyl chloride (PVC). ASTM standards D1784, D1785, D2241, D2466, F794, D2774; AASHTO standard M304; AWWA standards C900 or C905; and ASABE/ANSI standard S376.
6. Acrylonitrile-butadiene-styrene (ABS). ASTM standards D1527, D2282, and D3965.
7. Polyethylene (PE; commonly referred to as PE or HDPE, the primary difference being product density). ASTM standards D3350, F714, D2104, D2239, D2447, D2513, D2737, D3035, F405, F667, F771, F894, and D2774; AASHTO standard M294; AWWA standards C901 and C906; and ASABE/ANSI standard S376.

Pipe shall be marked as directed by the applicable reference standard(s) but shall have at a minimum: nominal pipe size, pipe material, dimensioning system (IPS, NPS, Sch, etc.), thickness (pressure rating or substitute designation from which the pressure rating can be obtained), and manufacture's name or trademark.

Unless otherwise set forth in Section 5, pipe and fittings shall have a protective coating applied and shall conform to one of the following specifications, as applicable:

AWWA C104, AWWA C116, AWWA C203, AWWA C203, AWWA C209, AWWA C210, AWWA C213, AWWA C214, AWWA C218, ASTM A53, ASTM A123/A 123M, or ASTM A153/A

All joints and connections shall be constructed to withstand the design working pressure for the pipeline without leakage and shall leave the inside of the pipeline free of any obstruction which could reduce the pipe capacity below design requirements.

All fittings, such as couplers, reducers, bends, tees and endives shall be made of material that is recommended for use with the type of pipe specified and shall be installed in accordance with the recommendations of the pipe manufacturer.

Joints and connections for steel pipe shall meet the following requirements:

- Field joints shall be installed according to the manufacturer's recommendations. On buried pipelines, high-resistance joints between pipe lengths shall be electrically bridged with a welded, brazed, or soldered copper wire. If coated pipe is field welded, care shall be taken to avoid burning the protective coating. After joints are welded, they shall be covered with a coating equal in quality to that specified for the pipe and hardware.

Plastic pressure pipe fittings shall conform to the following ASTM specifications, as applicable: D 2464, D 2466, D 2467, D 2468, D 2609, D 2672, D 2683, D 3139, or D 3261

Solvents for solvent-welded plastic pipe joints shall conform to the following ASTM specifications, as applicable: D 2235, D 2564, or D 2855

Rubber gaskets for pipe joints shall conform to the requirements of ASTM F477.

VALVES AND OTHER APPURTENANCES

The pipeline valves and appurtenances shall be of the size, type, material and pressure rating as shown on the drawings. If not specified in the design, pressure ratings shall equal or exceed that of the pipe.

Pressure relief valves shall be stamped with the pressure at which the valve starts to open. Adjustable valves shall be sealed or otherwise altered to ensure that the setting marked on the valve is not changed.

All other appurtenances, such as valve housings, shall be made of non-corrosive material and shall be according to manufacturer's recommendations, Section 5 and/or the drawings.

CONCRETE

Concrete used for thrust blocks shall have a minimum compressive strength, at 28 days, of 3000 psi. If the supplier cannot show evidence that a mix will meet strength requirements, a mix with a maximum net water content of seven gallons per bag (94 lbs.) of cement, and a minimum cement content of five and a half (5.5) bags per cubic yard of concrete, may be used

3. PIPE INSTALLATION

Pipelines shall be placed so that they are protected against hazards imposed by traffic, livestock, farm operations, freezing temperatures, or soil cracking. Other means of protection must be provided if the depth required for protection is impracticable because of shallow soils over rock or for other reasons. Abrupt changes in grade must be avoided to prevent rupture of the pipe. All special pipe installation requirements of the pipe manufacturer shall be followed.

Upon pipeline completion, pipeline shall be flushed to ensure that air vents properly operate, and airlocks do not occur.

ABOVE GROUND INSTALLATIONS

For suspension installations the pipe supports (saddle, rack, stand, hanger, etc.) shall meet design specifications and manufacturer or industry recommendations. Unless otherwise specified on the drawings, pipe shall (1) be supported a minimum of one foot above the ground, (2) have two layers of felt strips placed between the pipe and the support, and (3) have graphite lubricant placed between the pipe and the felt strip. Treated wood shall be used for timber supports.

Unless otherwise specified on the drawings, above ground pipelines with restrained joints (e.g., welded steel or banded CMP) shall have: (1) expansion couplers installed at a spacing not to exceed 400 feet, (2) a maximum distance between a coupler and a fixed or anchored location of 200 feet, and (3) couplers that provide for a minimum of 4 inches of travel distance.

For installations designed for laying the pipe across naturally occurring terrain, the pipe shall be firmly and uniformly bedded throughout its entire length. For corrugated metal pipe the bedding shall facilitate pipe installation so that at least the bottom 25% of the pipe circumference shall be in contact with the pipe.

Unless otherwise specified on the design, bedding material shall be imported if the ground surface will result in point loads or unacceptable abrasion on the pipe (e.g., bedrock or rock outcrops). Blocking or mounding shall not be used to bring the pipe up to final grade. Unless otherwise specified on the drawings, supports/saddles specifications as described above shall be followed.

The pipe shall not be handled in a manner to cause damage to the pipe and its coating. The pipe shall not be rolled or dragged on the ground. The pipe shall be placed onto above ground supports by the use of canvas slings or padded cables. Individual joints of pipe shall be inspected, and any damaged pipe shall be removed and replaced.

UNDERGROUND INSTALLATIONS

a. Trench Construction

Trench depth and depth of cover shall be as specified on the drawings.

Trench width at any point below the top of the pipe should be only wide enough to permit the pipe to be easily placed and joined and to allow the initial backfill to be safely and properly placed and compacted. The minimum trench width is dependent on backfill

placing and compacting equipment, but for typical manual installation clearance on either side of the pipe shall be 9 inches unless the trench is precision excavated with a semicircular bottom that closely fits the pipe. In that case, the minimum clearance on either side of the pipe shall be 6 inches. The maximum trench width shall be no greater than the minimum required by backfill placing and compacting equipment, but for typical manual installation shall be 30 inches greater than the outside diameter of the pipe (i.e., maximum clearance between the pipe and trench wall shall be 15 inches).

Trenches more than 5 feet deep shall be shored, sloped, or benched to provide safe and stable trench walls. Unless otherwise specified on the drawings, trenches shall be constructed according to Figures 1 through 5; or as provided in OSHA Construction Safety Regulations, Subpart P, Excavations, Appendix B – Sloping and Benching.

Where rock, hardpan, cobbles or other hard material which might prevent the pipe from being uniformly supported is encountered in the bottom of the trench, the trench shall be undercut a minimum of four inches below final grade. The trench shall then be brought back to grade with appropriate backfill material placed and compacted to provide proper bedding.

More than one pipe may be placed in a common trench. In such cases with typical manual installation the minimum and maximum clearances shall apply, and the minimum distance between pipes shall be 12 inches to facilitate safe and proper backfill installation.

b. Bedding

The pipe shall be firmly and uniformly bedded throughout its entire length. Bedding material, if necessary, shall be placed and spread in uniform layers and in such a manner as to fill the trench so there are no unfilled spaces (air pockets) below the pipe. For pipe with bell joints, holes shall be dug in the bedding at the bells to permit the body of the pipe to be in contact with the bedding along its entire length. Blocking or mounding shall not be used to bring the pipe up to final grade.

The pipe shall not be dropped into the trench or handled in a manner to cause damage. PVC pipe shall not be handled when the temperature is less than 20°F or greater than 100°F. PE pipe shall not be handled when the temperature is less than 10°F or greater than 110°F. The pipe shall be allowed to come within a few degrees of the temperature it will have after it is completely backfilled before placing fill other than that needed for shading or before connecting the pipe to other facilities. Individual joints of pipe shall be inspected, and any damaged pipe shall be removed and replaced.

Thrust blocks shall be formed against a solid trench wall. They shall be of the minimum size and materials as specified on the drawings.

The thrust block cavity shall be in undisturbed soil or previously placed compacted backfill that yields an acceptable allowable bearing pressure. The cavity shall be formed with soil or wood to hold the freshly placed concrete without displacement until an initial set has occurred.

When excavation beyond the designated trench widths and depths, as shown on the drawings or specified in Section 5 of this specification, occurs at locations where installation of concrete thrust blocks is required, the contractor shall install an alternative thrust block provision.

The concrete thrust block shall have a thickness, length, and depth as shown on the drawings or specified in Section 5. Backfill shall be placed on all sides of the thrust block and to the sides of the excavation.

c. Backfill

Initial Backfill. Unless otherwise specified in the design solid wall pipe 18 inches nominal diameter or less the initial backfill material may be fine grained soil. This may be the on-site trench excavated materials as long as any unsuitable materials are removed; it must be free of rocks, gravels, frozen materials larger than 1 inch or earth clods greater than 2 inch in diameter. Unless otherwise specified in the design, for solid wall pipe greater than 18 inches nominal diameter and corrugated, ribbed, or profile wall pipe, the initial backfill material shall be angular 1 to ¼ inch size crush stone with a maximum of 10 percent cohesive fines or sand and gravels (Soil types GW, GP, SW, and SP) with a maximum particle size of 1 inch containing a maximum of 12 percent of non-cohesive fines. Sands shall have a maximum of 45 percent passing the # 40 sieve.

Unless otherwise specified in the design, initial backfill shall be placed in lifts no greater than 8 inches deep before being compacted. For typical manual installation, each lift shall be worked to eliminate any unfilled spaces and compacted with appropriate tamping equipment and significant effort. When backfilling is done by mechanical means the initial fill shall first be worked to eliminate any voids.

The initial backfill materials shall be placed in a manner so as not to displace, deform or damage the pipe.

When water packing is used, the pipe shall be filled with water. The initial backfill, before wetting, shall be of sufficient depth to ensure complete coverage of the pipe with backfill after consolidation has taken place. Water packing shall be accomplished by adding water to diked reaches of the trench in such quantity as to thoroughly saturate the initial backfill. After the backfill is saturated, the fill shall be consolidated by rodding or with a vibrator. The wetted fill shall be allowed to dry until firm before completing the final backfill. The pipeline shall remain full of water until after the final backfill is placed.

Final Backfill. The final backfill material shall be free of rocks, frozen clods or other debris larger than 1inch in diameter within 6 inches of the pipe and 6 inches in particle size for the remaining portion of the final backfill unless otherwise specified in the design. The material shall be placed and spread in approximately uniform layers so there are no unfilled spaces in the backfill. Rolling equipment shall not be used until a minimum of 18 inches of compacted backfill material has been placed over the top of the pipe

Final backfill shall result in a finished trench surface that is smooth, slightly rounded so that the trench surface is higher than the surrounding ground, free of rocks greater in

size than the surrounding surface and has a clean and finished appearance.

Plastic pipelines may be placed by plow-in equipment if soils are suitable and rocks and boulders will not damage the pipe.

All disturbed areas shall be revegetated according to the recommendations for permanent seeding as stated in Conservation Practice Standard PA342, Critical Area Planting and/or the Pennsylvania Agronomy Guide.

4. BASIS OF ACCEPTANCE

The acceptability of the pipeline shall be determined by inspections to check compliance with all the provisions of this standard and specifications including the design of the line, the pipe, and pipe marking, the appurtenances, and the minimum installation requirements.

The pipeline shall be pressure tested for leaks. Before pressure testing, the joints of the assembled pipeline shall be allowed to set as recommended by the manufacturer and all concrete thrust blocks shall be in place and allowed to cure for a minimum of 3 days.

Pipeline shall be pressure tested by one of the following methods:

1. Before backfilling, fill the pipe with water and test at the design working head or at a minimum head of 10 ft., whichever is greater. All leaks must be repaired, and the test must be repeated before backfilling.
2. Pressure test at the working pressure for 2 hours. The allowable leakage shall not be greater than one gallon per diameter inch per mile. If the test exceeds this rate, the defect must be repaired until retests show that the leakage is within the allowable limits, but all visible leaks must be repaired.

If water is not available to complete a test, the installer shall provide a guarantee stating they will return and fix leaks that are found when the pipe is initially filled with water.

All materials shall conform to these minimum requirements and to the tests prescribed in the applicable ASTM Specification. If requested by the engineer, a qualified testing laboratory must certify with supporting test results that the pipe meets the requirements specified in this specification. The seal of approval of a recognized laboratory on pipe bearing the ASTM or AWWA designations may be accepted for this certification.

The installing contractor shall certify that the materials and installation comply with the requirements of these specifications. He shall furnish a written guarantee against defective workmanship and materials to cover a period of not less than one year. The installing contractor shall furnish a copy of the certification and guarantee, which will be made a part of the supporting records of the pipeline.

5. ADDITIONAL CONDITIONS WHICH APPLY TO THIS PROJECT ARE:

USDA United States Department of Agriculture

Natural Resources Conservation Service
Practice Specification
Pumping Plant (Code 533)

1. SCOPE

The work shall consist of furnishing materials and installing all components of the pumping facility, as outlined in this specification and the drawings.

2. MATERIALS

All materials used shall conform to the size, type, etc. noted on the plans, set forth in Section 6, or as otherwise listed below:

1. PUMP:

   The pump shall meet the required capacity, pressure, and head requirements, as specified in Section 6 or on the drawings. Pumps shall be compatible and resistant to the type of water or manure being conveyed.

   The contractor shall be responsible for assessing the consistency, nature, quality and quantity of the substance to be pumped, and provide the appropriate equipment. The contractor shall provide in writing, or by performance tables provided by the manufacturer, the pumps performance characteristics (discharge, head, and pressure) and the relationship to or requirements of the following:
   a. Operating power requirements
   b. Estimated service life
   c. Maintenance requirements
   d. Efficiency

2. PIPE:

   Suction and Discharge pipe shall be chosen so that the type and class of pipe exceeds the systems pressure requirement. The operating pressure shall be specified in Section 6 or on the drawings, or as determined by the pump manufacturer. If the pipe is an integral part of another related planned practice or distribution system, the pipe type and class shall meet or exceed the requirements of the pipe installed in that planned system.

   Fittings shall be rated equal to the pipe being specified.

   The pipe and fittings, where applicable, shall be marked by the manufacturer as described in the applicable ASTM specification.

   Used pipe or seconds shall not be used. Pipe shall be approved by the engineer prior to installation.

3. CONTROLS:

   All check valves and directional control valves, gauges, quick disconnects, and automatic controls shall be durable and constructed with a rust resistant, non-corrosive, material able to withstand the type of water, or manure being pumped.

4. SUCTION AND DISCHARGE BAYS:

   Suction and discharge bays shall be designed to conform to the hydraulic characteristics of the pump. They shall be to the dimension and capacity as specified in Section 6 or on the drawings.

   Precast concrete units shall be in conformance with PennDOT specifications for such units and/or comply with ACI-525 and 533. All concrete units shall have a 28-day compressive strength of 4000psi., or greater, and all reinforcement bars shall be of grade 60 steel or higher, unless otherwise specified in Section 6 or on the drawings.

   Portland cement shall be Type I, IA, II, or IIA and conform to ASTM-C150, unless otherwise set forth in Section 6. If Type I or II is used, an air-entrainment agent shall be used.

   Concrete Aggregate shall meet the requirements and gradation specified in ASTM-C33. Coarse aggregate shall meet the gradation for size numbers 57 or 67.

   Reinforcement bars shall conform to ASTM-A615, A616, or A617. Welded wire fabric reinforcement shall conform to ASTM-A185 or A497. Reinforcement shall be free from loose rust, oil, grease, curing compound, paint or other deleterious coatings.

   All rock structures shall be of rock that is durable and resistant to weathering. The rock shall be of the type specified in Section 6 and shall be obtained from a source listed in the most current edition of PennDOT Bulletin #14. The gradation of the rock shall comply with the requirements set forth by the National Crushed Stone Association.

5. HOUSING AND ACCESSORIES:

   Trash racks, housings, and other devices shall be installed as shown on the drawings provided to and concurred in by NRCS. All materials furnished and installed shall conform to the quality and grade noted on the drawings. A site-specific set of construction drawings shall be at the site during construction.

   Wood shall be graded and stamped by an agency accredited by the American Lumber Standards Committee as meeting the required species, grade, and moisture content. All exposed or buried lumber shall be pressure treated. Pressure treated wood products shall be Douglas Fir, Southern Yellow Pine, or as otherwise specified in Section 6 or on the drawings. They shall be treated with preservatives in accordance with the American Wood Preservers Association (AWPA) Standard C16 for "wood used on Farms, Pressure Treatment". Non-CCA preservative pressure treated lumber shall be used where aquatic life is a concern.

   Roofing material shall be corrugated 29 gage galvanized steel. Equivalent or better material maybe approved by the Engineer.

   Sheet piling shall be of steel or vinyl type. The piling must be of the thickness and grade specified in Section 6, and as recommended by the manufacturer for the intended use. Suitable methods of installing and anchoring the piling shall be as listed in Section 6, and as recommended by the manufacturer.

3. SITE PREPARATION

All trees, brush, fences, and other debris shall be cleared so as not to interfere with construction or proper functioning of the Pumping Plant system. All material removed by the clearing and grubbing operation shall be disposed of as directed by the Owner or his/her Representative.

4. SAFETY

All positive responses from the Pennsylvania One Call System should be shown on the drawings and the Pennsylvania One Call serial number and date noted on the plans. It is the Contractor's or Landowner's responsibility to contact the affected utility for marking at the time of construction.

The Contractor must comply with OSHA requirements Part 1926, subpart P, for protection of workers entering trenches.

5. INSTALLATION

Pipelines shall be placed so that they are protected against hazards imposed by traffic, farm operation, freezing temperatures, or soil cracking. Other means of protection must be provided if the depth required for protection is impractical because of shallow soils over rock or for other reasons.

Trenches for pipeline shall be free of rocks and other sharp-edged materials. The pipe shall be carefully placed to prevent damage.

Before backfilling, the pipeline shall be pressure tested. To pressure test the pipe, fill the pipe with water and test at the design working head and pressure. All leaks must be repaired, and the test must be repeated before backfilling.

All backfilling shall be completed before the line is placed in service. The initial backfill shall be of selected material that is free of rocks or sharp-edged materials that can damage the pipe.

Deformation or displacement of the pipe must not occur during backfilling.

All seeding shall be in accordance with the Critical Area Planting Standard and Specifications (PA342).

6. ADDITIONAL CONDITIONS WHICH APPLY TO THIS PROJECT ARE:

USDA United States Department of Agriculture

Natural Resources Conservation Service
Practice Specification
Roof Runoff Structure (Code 558)

1. SCOPE

The work shall consist of furnishing, fabricating, and installing all components of the roof runoff structure(s) as outlined in this specification and as shown on the drawings.

2. MATERIALS

GUTTERS, DOWNSPOUTS, AND SUPPORTS shall be made of aluminum, galvanized steel, wood, or plastic, and the size and type set forth in Section 4, or as shown on the drawings. Aluminum gutters and downspouts shall have a nominal thickness of at least 0.027 and 0.020 in (0.07 and 0.05 cm), respectively. Galvanized steel gutters and downspouts shall be at least 28 gauge. Wood gutters shall be redwood, cedar, cypress, or pressure-treated, and shall be clear and free of knots. Plastics shall contain ultraviolet stabilizers. Supports shall have sufficient strength to withstand anticipated water, snow, and ice loads. The type of supports for manufactured gutters and downspouts shall be determined by the manufacturer's requirements, given the type of installation and type of gutter or downspout.

DRAIN FILL for subsurface drains and driplines shall meet the size and quality requirements of PennDOT Publication 408, Section 704, Type A, Coarse Aggregate, with gradation as shown in Section 4 or in the drawings.

DRAIN PIPE for subsurface drains and drip lines shall be perforated corrugated polyethylene (PE) pipe and fittings meeting the requirements of ASTM F405 or ASTM F667.

APPURTENANCES, such as storage tanks, guard pipe, flush diverters, etc., if required, shall be of the materials set forth in Section 4 and/or the drawings.

3. INSTALLATION

Gutters and drainpipes shall be installed at the locations and grades shown on the drawings. Gutter supports shall have maximum spacing of 48 in (120 cm) for galvanized steel and 24 in (60 cm) for aluminum or plastic. Joints shall be made watertight with the use of mastics or by welding. Dissimilar metals shall not be in contact with each other. Wood gutters shall be mounted on fascia boards using furring blocks that are a maximum of 24 in (60 cm) apart.

Gutters shall be hung so that the outer edge of the gutter is below the projection of the roof line as shown on the drawings. Roof edges shall be nearly level. Replacement or repair of structure members may be necessary to provide a nearly level and uniform roof edge.

Downspouts shall be securely fastened at the top and bottom, with intermediate supports that are a maximum of 10 ft (3 m) apart.

Drain pipe shall be installed in accordance with ASTM F449.

Drain fill shall be placed in the drip drain trench in such a manner so as not to be contaminated with adjacent soil. Geotextile may be used to envelop the bottom and sides of the drain fill to accomplish this. Geotextile shall have properties equal to or exceeding the requirements of NRCS Design Note 24.

Outlets shall be located as shown on the drawings. Where downspouts empty directly onto the ground surface there shall be an elbow to direct the flow away from the building and splash blocks or other protection to prevent erosion. Downspouts shall not outlet into foundation drains.

4. **ADDITIONAL CONDITIONS WHICH APPLY TO THIS PROJECT ARE:**

Natural Resources Conservation Service
Practice Specification
Access Road (Code 560)

1. SCOPE

The work shall consist of construction of the Access Road at the location, and to the dimensions and grades, shown on the drawings and as staked in the field.

2. SITE PREPARATION

All trees, stumps, roots, brush, weeds, and other objectionable material shall be removed from the work area and disposed of as directed.

All unsuitable material shall be removed from the roadbed area prior to placing fill or surfacing materials.

The roadbed shall be graded to the required elevations. All areas which require filling will be scarified prior to placement of fill. All fill shall be compacted according to the specified method with the appropriate equipment or to the specified density.

3. SURFACING

Aggregate for the subbase shall be clean and free from deleterious substances.

GEOTEXTILE shall meet the requirements as outlined in NRCS Design Note 24 and NRCS Material Specification 592 or as otherwise stated in Section 6.

Gradation shall be such that a stable base will be formed. Placement of the surface course shall be in accordance with sound highway construction practices.

4. SEEDING

All disturbed areas shall be revegetated as designated on the drawings.

5. EROSION CONTROL

Construction operations shall be carried out in such a manner that erosion and air and water pollution will be minimized. State and local laws concerning pollution abatement must be followed.

6. ADDITIONAL CONDITIONS WHICH APPLY TO THIS PROJECT ARE:

USDA United States Department of Agriculture

Natural Resources Conservation Service
Practice Specification
Heavy Use Area Protection (Code 561)

1. SCOPE

The work shall consist of furnishing materials and installing all components of the paved surface treatment areas for heavy use area protection as outlined in this specification and the drawings.

2. MATERIALS

All materials used shall conform to the quality and grade noted on the plans, set forth in Section 6, or as otherwise listed below:
PORTLAND CEMENT shall be Type I, IA, II, or IIA and conform to ASTM-C150, unless otherwise set forth in Section 6. If Type I or II is used, an air-entrainment agent shall be used.

CONCRETE AGGREGATE shall meet the requirements and gradation specified in ASTM-C33. Coarse aggregate shall meet the gradation for size numbers 57 or 67.

WATER used in mixing or curing concrete shall be clean and free from injurious amounts of oil, acid, salt, organic matter or other deleterious substances.

REINFORCEMENT BARS shall be grade 40 or higher, and shall conform to ASTM-A615, A616, or A617.Welded wire fabric reinforcement shall conform to ASTM-A185 or A497. Reinforcement shall be free from loose rust, oil, grease, curing compound, paint or other deleterious coatings.

CONCRETE ADMIXTURES shall conform to ASTM-C260 for air-entrainment, and ASTM- C494, type A,D, F or G, for water-reduction and set-retardation, and type C or E for non- corrosive accelerators.

POZZOLAN shall conform to ASTM-C618.

COAL COMBUSTION BYPRODUCTS (CCB) shall have a chemical analysis that provides adequate cementing and safety (toxicity) for the purpose intended.

CURING COMPOUND shall meet the requirements of ASTM-C309, Type 2, Class A or B, or as otherwise required in Section 6.

MASONRY COMPONENTS shall meet the requirements of ASTM-C90 & C270 and be placed in accordance with ACI - 530.

PRECAST CONCRETE units shall comply with ACI-525 and 533.

PREFORMED EXPANSION JOINT FILLER shall conform to the requirements of ASTM-D1752, Type I, II, or III, unless bituminous type is specified, in which case it shall conform to ASTM-D994 or D1751.

JOINT SEALERS shall conform to the requirements for ASTM-C920, Federal Specification SS-S-210A, or Federal Specification TT-S-227, as appropriate for the specific application.

WATERSTOPS. Vinyl-chloride polymer types shall be tested in accordance with Federal Test Method Standard No. 601 and shall show no sign of web failure due to brittleness at a temperature of -35 degrees Fahrenheit. Colloidal (bentonite) waterstops shall be at least 75 percent bentonite in accordance with Federal Specification SS-S-210A. Non-colloidal waterstops shall only be used if approved by the Engineer.

AGGREGATES. Aggregates shall meet the requirements of Pennsylvania Dirt and Gravel Road Program(DSA), PennDOT Pub. 408, Section 703, for the gradations specified in the drawings or Section 6, or as otherwise set forth in Section 6.

BITUMINOUS CONCRETE. Bituminous concrete shall meet the requirements of PennDOT Pub. 408,Sections 401, 420 and 421, for the course(s) specified in the drawing or Section 6, or as otherwise set forth in Section 6.

WOOD shall be graded and stamped by an agency accredited by the American Lumber Standards Committee as meeting the required species, grade, and moisture content. In the absence of such a stamp, the Contractor or material supplier shall provide written certification that the wood products meet the designated quality criteria.

PRESSURE TREATED WOOD PRODUCTS shall be Douglas Fir, Southern Yellow Pine, or as otherwise specified on the drawings or in Section 6. They shall be treated with preservatives in accordance with the American Wood Preservers Association (AWPA) Standard C16, "Wood Used on Farms, Pressure Treatment." Each piece shall bear the AWPA stamp of quality. In the absence of such a stamp, the Contractor or material supplier shall provide written certification that the pressure treated wood meets the designated quality criteria.

FASTENERS for roofs and covers shall be stainless steel and/or galvanized in accordance with ASTM A153, and/or A653 Class G185, and Type 304 or 316, or otherwise protected from corrosion due to contact with moisture, manure and associated gasses. All fasteners, connectors, and any other metal contacting ACZA, ACQ or CA treated wood shall be stainless steel, in accordance with Supplement A below.

GEOTEXTILES. Geotextiles shall meet the requirements of PennDOT Pub. 408, Sections 212 and 735,for the Type and Class specified in the drawings or Section 6, or as otherwise set forth in Section 6.

ORGANIC SURFACES. Materials such as tanbark and saw dust shall be free of contaminants and rot.

3. FOUNDATION PREPARATION

Clear all trees, brush, fences, manure, and rubbish within the area to be protected, including any appurtenances, and borrow areas. All material removed by clearing and excavation operations shall be disposed of as directed by the Owner or his/her Representative. Sufficient topsoil is to be stockpiled in a convenient location for use on disturbed areas to facilitate seeding.

Set all base course material on undisturbed soil or non-yielding compacted material. Geosynthetics may be used, if approved by the Engineer, to further separate and/or stabilize the foundation. Over-excavation must be corrected as noted on the drawings or as directed by the Engineer or his/her designated Representative.
Surface and subsurface drainage systems shall be installed and operating adequately to remove water from the foundation to allow for proper placement of base and surface materials.

Drain fill upon which concrete is to be placed shall be covered with a geosynthetic that has an AOS between 20 and 100, inclusive.

4. BASE COURSE

The base course shall be placed on the area to the grades and thicknesses shown on the plans. The base material shall be as set forth in Section 6 and/or as shown on the drawings. The material shall be wetted and compacted by rollers or other construction equipment approved by the Engineer.

5. SURFACE TREATMENTS

A. Portland Cement Concrete

CONCRETE MIX

Unless otherwise specified in Section 6, concrete shall be proportioned to provide a minimum compressive strength at 28 days of 4,000 psi. The Contractor shall be responsible for the design of the mix and certification of the necessary strength, in accordance with ACI 301. Acceptance and certification of design mixes by PennDOT within the past year may be accepted in lieu of additional testing.

REINFORCING STEEL PLACEMENT

Reinforcement shall be accurately placed and secured in position in a manner that will prevent its displacement during the placement of concrete.
Steel shall be supported by precast concrete bricks (not clay bricks), metal or plastic chairs, or hard fieldstone. Except for dowel rods, placing steel reinforcement into concrete already in place shall not be permitted.

The following tolerances will be allowed in the placement of reinforcing bars shown on the drawings:

1. Maximum reduction in cover: from exposed surfaces -1/4 inch from earth surfaces -1/2 inch

2. Maximum variation from indicated spacing: 1/12th of indicated spacing

Splices of reinforcing bars shall be made only at the locations shown on the drawings, unless otherwise approved by the Engineer. Unless otherwise required, welded wire fabric shall be spliced by overlapping sections at least one full mesh dimension plus too inches. All reinforcement splices shall be in accordance with ACI 318.

Reinforcing steel shall not be welded unless approved by the Designer.

The ends of all reinforcing steel shall be covered with at least 1-1/2 inches of concrete.

MIXING AND HANDLING CONCRETE

In general, concrete shall be transported and placed in accordance with ACI-304, of which some specific interpretations are set forth below.

For concrete mixed at the site, the mixing time after all cement, aggregates and water are in the mixer drum shall be at least 1-1/2 minutes. Concrete shall be conveyed from the mixer as rapidly as practical by methods that will prevent segregation of the aggregates or loss of mortar. Concrete shall be placed within1-1/2 hours after the introduction of cement to the aggregate unless an approved set- retarding admixture is used in the mix. During periods of hot weather, it may be necessary to reduce this time.

For each load of concrete delivered to the site, a batch ticket shall be provided to the Owner or Technician by the Supplier. As a minimum, this ticket shall show the design strength, time out, admixtures (if any), and amount of water that may be added (if any) on site and still be within the design mix limits.

The Contractor shall test slump and air entrainment as necessary to ensure that the concrete meets the requirements of this specification. The slump shall be three to six inches (without superplasticizers) and the air content shall be five to seven percent of the volume of the concrete. Admixtures such as superplasticizers, water-reducers and set-retarders may be used provided they are approved by the Engineer prior to concrete placement and are used in accordance with the manufacturer's recommendations. Superplasticizers (ASTM C494, Type F or G) may be added to concrete that has a 2- to 4- inch slump before the addition, and that is not warmer than 95o F. The slump shall not exceed 7½ inches with the addition of superplasticizer.

Concrete shall be uniform and thoroughly mixed when delivered to the job site. Variations in slump of more than one inch within a batch will be considered evidence of inadequate mixing and shall be corrected or rejected. No water in excess of the amount called for by the job design mix shall be added to the concrete.

Immediately after placement, concrete shall be consolidated by spading and vibrating, or spading and hand tamping. It shall be worked into corners and around all reinforcement and embedded items in a manner which prevents segregation. Excessive vibration which results in segregation of materials will not be allowed. Vibration must not be used to make concrete flow in forms, slabs, or conveying equipment.

If the surface of a layer in place will develop its initial set, i.e., will not flow and merge with the succeeding layer when vibrated, a construction joint shall be made. Construction joints shall be made by cleaning the hardened concrete surface to exposed aggregate by sandblasting, air/water jetting, or hand scrubbing with wire brush, and keeping the concrete surface moist for at least one hour prior to placement of new concrete.

Concrete surfaces do not require extensive finishing work; however, the surface shall be smooth and even, with no depressions that would result in surface water ponding. Careful screeding (striking-off) and/or wood float finishing shall be required. Any additional desired finishing of the surface (such as roughening for improved traction) shall be accomplished after an initial stiffening of the concrete has taken place. These requirements will be stated in Section 6 or on the drawings. Exposed edges should be chamfered, either with form molding or molding tools.

The addition of dry cement or water to the surface of screeded concrete to expedite finishing is not allowed. If concrete placing is discontinued prior to completion of the entire structure, the unfinished end of the concrete shall be formed to create a proper construction or expansion/contraction joint.

EXPANSION/CONTRACTION JOINTS

When required in Section 6 or on the drawings, expansion/contraction joints shall contain a six-inch, Type B, vinyl waterstop with a minimum web thickness of 1/8-inch, or an approved joint sealer.

FORM REMOVAL AND CONCRETE REPAIR

Forms for walls and columns shall not be removed for at least 24 hours after placing the concrete. When forms are removed in less than seven days, the exposed concrete shall be sprayed with a curing compound or be kept wet continuously for the remainder of the curing period. Forms which support beams or covers shall not be removed for at least seven days, or 14 days if they are to support forms or shoring.

Forms shall be removed in such a way as to prevent damage to the concrete. Forms shall be removed before walls are backfilled. Columns shall be at least seven days old before any structural loads are applied.

Concrete that is damaged or otherwise defective shall be removed and replaced, or where feasible, repaired. The Engineer will determine the required extent of

removal, replacement, or repair. The plan for accomplishing the repair must be approved by the Engineer prior to beginning the repair work. Where minor areas of the concrete surface are "honeycombed," damaged or otherwise defective, the area maybe cleaned, wetted, and then filled with a dry-pack mortar. Dry-pack mortar shall consist of one part Portland cement and three parts sand with just enough water to produce a workable paste.

CONCRETING IN COLD WEATHER

Concreting in cold weather shall be performed in accordance with ACI-306R-88. In addition, the contractor shall provide a written plan at least 24 hours in advance of placing concrete in cold weather and shall have the necessary equipment and materials on the job site before the placement begins.

CONCRETING IN HOT WEATHER

Concreting in hot weather shall be performed in accordance with ACI 305, of which some specific interpretations are set forth below.

The supplier shall apply effective means to maintain the temperature of concrete below 90 degrees) Fahrenheit during mixing and conveying. Exposed surfaces shall be continuously moistened by means of fog spray or otherwise protected from drying during the time between placement and finishing, and during curing. Concrete with a temperature above 90 degrees Fahrenheit shall not be placed.

CURING

In general, concrete shall be cured in accordance with ACI-308. Specifically, it shall be prevented from drying for at least seven days after it is placed. Exposed surfaces shall be kept continuously moist during this period by covering with moistened canvas, burlap, straw, sand, or other approved material unless they are sprayed with a curing compound.

Concrete, except at construction joints, may be coated with a curing compound in lieu of continuous application of moisture. The compound shall be sprayed on moist concrete surfaces as soon as free water has disappeared but shall not be applied to any surface until patching, repairs and finishing of that surface are completed. Curing compound shall not be allowed on any rebars.

Curing compound shall be applied in a uniform layer over all surfaces requiring protection at a rate of not less than one gallon per 150 square feet of surface. Surfaces subjected to heavy rainfall or running water within three hours after the curing compound has been applied, or otherwise damaged, shall be resprayed. Any construction activity which disturbs the curing material shall be avoided. If the curing material is subsequently disturbed, it shall be reapplied immediately.

B. Bituminous Concrete

Bituminous concrete shall be installed in accordance with PennDOT Pub. 408, Sections 305, 320, & 400,as appropriate, and/or as otherwise set forth in Section 6.

C. Compacted Stone Aggregate
Compacted stone aggregate surfaces shall consist of the material specified in the drawing or Section 6. The material shall be moist and uniformly placed on the prepared base. The loose material shall be place to an adequate thickness so that when compacted the finished thickness is as specified. The stone aggregate shall be compacted with a vibratory smooth wheeled roller or other approved equipment to form a dense, smooth surface.

D. Other Materials and Structures
Surface treatments, such as saw dust, coal combustion byproducts, soil cement, etc., shall be placed asset forth in Section 6, and to the grades and thicknesses shown on the drawings.

6. ADDITIONAL CONDITIONS WHICH APPLY TO THIS PROJECT ARE:

USDA United States Department of Agriculture

Natural Resources Conservation Service
PRACTICE SPECIFICATION
SUBSURFACE DRAIN
(Code 606)

1. SCOPE

The work shall consist of furnishing materials and installing all components of the subsurface drain as outlined in the specification and the drawings.

2. MATERIALS

a. DRAINFILL AGGREGATE shall meet the requirements of Penn DOT, Publication 408, Section 703, fine and coarse aggregate. The size and gradation shall be as specified in the additional conditions of this specification or on the drawings.

Table 1 – Drain Pipe Requirements

Type	Specification
Concrete drain tile	ASTM-C-412
Concrete pipe for irrigation or drainage	ASTM-C-118
Concrete pipe or tile, determining physical properties of	ASTM-C-497
Concrete sewer, storm drain and culvert pipe	ASTM-C-14
Reinforced concrete culvert, storm drain and sewer pipe	ASTM-C-76
Perforated concrete pipe	ASTM-C-444
Portland cement	ASTM-C-150
Pipe, bituminized fiber & fitting	Federal Specification SS-P-1540
Styrene rubber (SR) plastic drain pipe & fitting	ASTM-D-2852
Polyvinyl chloride (PVC) sewer pipe & fitting	ASTM-D-2729
Polyvinyl chloride (PVC) pipe	ASTM-D-3034 type PSM
Corrugated polyethylene tubing & fitting (3-6 inch)	ASTM-F-405
Corrugated polyethylene tubing & fitting (8-24 inch)	ASTM-F-667
Pipe corrugated (steel, polymer coated)	ASTM-A-762
Pipe, corrugated (steel, zinc coated)	ASTM-A-76

b. PIPE shall meet the requirements of Table 1, and as set forth in Section 9 and/or on the drawings. All pipes shall be clearly marked with the appropriate specification designation. Provide UV protection for pipe stored and exposed to sunlight for extended periods of time exceeding 6 months or exceeding the pipe manufacturer's' limit for UV exposure. At the time of installation, it should be kept as cool as possible to minimize elongation of the pipe during installation.

GEOTEXTILE shall meet the requirements as outlined in NRCS Design Note 24 and NRCS Material Specification 592

3. SITE PREPARATION

All trees, brush, fences, and rubbish shall be cleared within the area that the subsurface drain will be installed. All material removed by the clearing and grubbing operation shall be disposed of as directed by the Owner or his/her Representative.

4. INSPECTION AND MATERIAL HANDLING

Material for subsurface drains shall be carefully inspected before the drains are installed. If applicable, clay and concrete tile shall be checked for damage from freezing and thawing before it is installed.

Bituminized fiber and plastic pipe and tubing shall be protected from hazard causing deformation or warping. Plastic pipe and tubing with physical imperfections shall not be installed. Any damaged section shall be removed and replaced. All material shall be satisfactory for its intended use and shall meet applicable specifications and requirements.

5. SAFETY

All positive "design" responses from the Pennsylvania One Call System are noted on the plans. It is the Contractor's or Landowner's responsibility to notify One Call of pending construction and to contact the affected utility for marking at the time of construction.

The Contractor must comply with OSHA requirements Part 1926, subpart P, for protection of workers entering trench.

6. INSTALLATION

Flexible conduits, such as plastic pipe or tubing and bituminized fiber pipe, shall be installed, according to the requirements in ASTM-F-449, "Standard Recommended Practice for Subsurface Installation of Corrugated Thermoplastic Tubing for Agricultural Drainage or Water Table Control."

All subsurface drains shall be laid to line and grade and covered with approved blinding, envelope, or filter material to a depth of not less than three inches over the top of the pipe. If an impervious sheet is used over the drain, at least three inches of blinding material must cover the sheet. No reversals in grade of the conduit shall be permitted.

If the conduit is to be laid in a rock trench or if rock is exposed at the bottom of the trench, the rock shall be removed below grade so that the trench can be backfilled, compacted and bedded. When completed, the tile conduit shall be not less than two inches from the rock.

Earth backfill material shall be placed in the trench in a manner to ensure that the conduit does not become displaced and so that the filter and bedding material, after backfilling, meet the requirements of the plans and specifications.

If a filter is needed, no part of the conduit containing openings shall be left exposed. If a sand-gravel filter material is used, it shall be a gradation that is compatible with the base material in the trench. The trench shall be over excavated three inches and backfilled to grade with filter material. After the conduit is placed on the filter material, additional filter material shall be placed over the conduit to fill the trench to a depth of three inches over the conduit.

7. FITTING AND CONNECTIONS

All fitting and connections for pipe shall be made with manufacturer-supplied components made for the intended purpose.

8. CONDUIT PERFORATIONS

If perforations are specified, the water inlet area shall be at least 1 inch/foot of the pipe length. The perforations shall be either circular or slots equally spaced around the circumference of the pipe in not less than three rows. Circular perforations shall not exceed 3/16 inch in diameter and slots shall not be more than 1/8 inch wide and 1 ¼ inch long for 3-, 4- and 5-inch diameter pipe, or 1 ½ inch for 6- and 8-inch diameter pipe, or 1 ¾ inch for 10- and 12-inch diameter pipe. All slots and circular perforations shall be cleanly cut.

9. ADDITIONAL CONDITIONS WHICH APPLY TO THIS PROJECT ARE:

Tires that were filled with antifreeze or other toxic liquids cannot be used for watering facilities, unless they are thoroughly cleaned before use. As a minimum, this shall include scrubbing the inside of the tire with a detergent and rinsing with a high-pressure washer. This process should be repeated at least four(4) times.

The tire shall be placed such that approximately 1/3 to 1/2 of the tire is below grade. As a minimum, 3" to 4" layer of compacted clay shall be placed as a foundation or seal before installing the tire. A 4" to 6" thick slab of concrete shall be placed to seal the hole in the bottom of the tire trough.

e. Plastic and fiberglass:

Plastic and fiberglass structures shall be made of ultraviolet resistant materials or shall have a durable coating for protection from sunlight.

Cast-iron, plastic, or fiberglass bathtubs are not acceptable for use, as a trough or tank.

f. Aggregate and geotextile:

Aggregates used for stabilization around the watering facilities shall meet the requirements of Penn DOT, Publication 408, Section 703, for coarse aggregate.

The size and gradation shall be as specified in Section 6 or on the drawings. The aggregate shall be hard, durable, and resistant to weathering.

Geotextile shall meet the requirements as outlined in NRCS Design Note 24 and NRCS Material Specification 592.

g. Pipe:

Unless otherwise shown on the plans or in Section 6, pipe, fittings, and components (e.g., valves), and their installation, shall comply with the requirements of construction specification PA516.

3. FOUNDATION PREPARATION

The foundation area, for the watering facility and related stabilization areas shall be cleared of organic matter and all other unsuitable material. When backfill is required to establish planned grade lines, within 2' of a structure, the backfill shall be compacted by hand-operated compaction equipment.

The foundation area and the immediately surrounding area shall be smoothed and graded to permit free drainage of surface water.

All construction shall be performed in a workmanlike manner and the job site shall have a neat appearance when finished.

4. EROSION AND POLLUTION CONTROL

Construction operations will be carried out in such a manner so erosion and air and water pollution will be minimized. Where required, this shall be in accordance with the E&S Control Plan

5. SEEDING

All disturbed areas shall be protected from erosion as soon, after installation of the structure, as practical. Vegetation, if required, shall be established at the locations shown on the drawings and/or staked in the field, and as set forth herein, in Section 6, and/or as shown on the drawings.

6. ADDITIONAL CONDITIONS WHICH APPLY TO THIS PROJECT ARE:

USDA United States Department of Agriculture

NATURAL RESOURCES CONSERVATION SERVICE
PRACTICE SPECIFICATION
WATERING FACILITY
(Code 614)

1. SCOPE

The work shall consist of furnishing materials and installing all components of the watering facility, as outlined in this specification and the drawings.

2. MATERIALS

All materials used shall conform to the size, quality and grade noted on the plans, set forth in Section 6, or as otherwise noted below.

a. Concrete and masonry:

Precast concrete and masonry structures are acceptable when their design and construction have been reviewed and approved.

Precast units shall comply with ACI-318, Chapter 16 and ACI-533.

Masonry components shall meet the requirements of ASTM-C90 & C270 and placed in accordance with ACI-530.

Concrete shall have a minimum compressive strength, at 28 days of 4,000 psi. If the supplier cannot show evidence that a mix will meet strength requirements, a mix with a maximum net water content of seven gallons per bag (94#) of cement and a minimum cement content of six bags per cubic yard of concrete, may be used. Coarse Aggregates shall be #57 or #67 for ready-mix and hand- mixed concrete. Hand-mixed concrete shall be mixed at a ratio of 1-part cement, 2-parts sand, and 3-parts coarse aggregate. Pre-bagged concrete mix will be mixed according to the manufacturer's recommendation.

Mixing water will be clean and free of substances that would affect the strength or durability of the concrete.

Concrete shall be mixed to a consistency that will allow proper consolidation i.e., slump between 3" and 6"

b. Metal:

Steel tanks shall have a minimum thickness of 20 gauge. The steel shall be galvanized for protection from deterioration.

c. Wood:

Wood products used for anchoring or protection measures shall be graded and stamped by an agency accredited by the American Lumber Standards Committee as meeting the required species, grade, and moisture content. Pressure treated wood products shall be Douglas Fir, Southern Yellow Pine, or as otherwise specified in Section 6 or on the drawings. They shall be treated with preservatives in accordance with the American Wood Preservers Association (AWPA) Standard UI as it relates to farm applications. In the absence of a stamp of quality, the contractor or material supplier shall provide written certification that the wood meets the designated quality criteria.

d. Rubber:

Rubber tires, used for troughs, shall be free of holes or deep abrasions. The tire sidewall shall be cut at an inward angle so to not expose any metal chords in the tire.

USDA United States Department of Agriculture

Natural Resources Conservation Service
PRACTICE SPECIFICATION
UNDERGROUND OUTLET
(Code 620)

1. SCOPE

The specification covers the fabrication, installation, and construction of underground outlets.

2. MATERIALS

The materials required for the underground outlet shall be as shown on the drawings or as otherwise required in Section 9.

a. DRAINFILL AGGREGATE shall meet the requirements of Penn DOT, Publication 408, Section 703, fine and coarse aggregate. The size and gradation shall be as specified in the additional conditions of this specification or on the drawings.

Table 1 – Drain pipe requirements:

Type	Specification
Concrete drain tile	ASTM-C-412
Concrete pipe for irrigation or drainage	ASTM-C-118
Concrete pipe or tile, determining physical properties of	ASTM-C-497
Concrete sewer, storm drain and culvert pipe	ASTM-C-14
Reinforced concrete culvert, storm drain and sewer pipe	ASTM-C-76
Perforated concrete pipe	ASTM-C-444
Portland cement	ASTM-C-150
Pipe, bituminized fiber & fitting	Fed Spec SS-P-1540
Styrene rubber (SR) plastic drain pipe & fitting	ASTM-D-2852
Polyvinyl chloride (PVC), SHD 40, 80, 120	ASTM-D-1785
Polyvinyl chloride (PVC) sewer pipe & fitting	ASTM-D-2729
Polyvinyl chloride (PVC), SDR 35, 26	ASTM-D-3034
Corrugated polyethylene tubing & fitting (3-6 inch)	ASTM-F-405
Corrugated polyethylene tubing & fitting (8-24 inch)	ASTM-F-667
Corrugated polyethylene tubing	ASTM F2648
Corrugated polyethylene tubing (3-10")	AASHTO M252
Corrugated polyethylene tubing (12-60")	AASHTO M294
Pipe, corrugated (steel, polymer coated)	ASTM-A-762
Pipe, corrugated (steel, zinc coated)	ASTM-A-760

b. PIPE shall meet the requirements of Table 1, and as set forth in Section 9 and/or on the drawings. All

pipes shall be clearly marked with the appropriate specification designation. If plastic pipe is stored on site for a length of time, it should be protected from sunlight. At the time of installation, it should be kept as cool as possible to minimize elongation of the pipe during installation.

c. GEOTEXTILE shall meet the requirements as outlined in NRCS Design Note 24 and NRCS Material Specification 592.

d. CONCRETE and related materials shall meet the requirements set forth in Construction Specification PA313, Waste Storage Facility and/or as set forth in Section 9.

All materials shall be carefully inspected prior to installation. Clay and concrete tile shall be checked for damage by freezing. Plastic pipe and tubing shall be protected from hazards causing deformation. Any damaged or imperfect pipe or tubing shall not be installed. Any pipe or tubing which is damaged during installation shall be removed and replaced.

3. SITE PREPERATION

All trees, brush, fences and rubbish shall be cleared within the area that the subsurface drain will be installed. All material removed by the clearing and grubbing operation shall be disposed of as directed by the Owner or his/her Representative.

4. INSPECTION AND MATERIAL HANDLING

Material for underground outlets shall be carefully inspected before the drains are installed. If applicable, clay and concrete tile shall be checked for damage from freezing and thawing before it is installed. Bituminized fiber and plastic pipe and tubing shall be protected from hazard causing deformation or warping.

Plastic pipe and tubing with physical imperfections shall not be installed. Any damaged section shall be removed and replaced. All material shall be satisfactory for its intended use and shall meet applicable specifications and requirements.

5. SAFETY

All positive "design" responses from the Pennsylvania One Call System shall be noted on the plans. It is the Contractor's or Landowner's responsibility to notify One Call of pending construction and to contact the affected utility for marking at the time of construction.

The Contractor must comply with OSHA requirements Part 1926, subpart P, for protection of workers entering trench.

6. EXCAVATION

Construction operations shall follow the erosion and sediment control plan.

Unless otherwise specified, excavation for each underground outlet shall begin at the outlet end and progress upstream. The trench shall be excavated to the grades and cross sections shown on the drawings. The trench width above the conduit may increase as necessary for safe installation or for the convenience of the Contractor. Trench shields, shoring, or bracing are required whenever workers will be in a trench deeper than four feet, or as otherwise required be OSHA Regulations.

7. INSTALLATION

BEDDING. In stable soils, the conduit shall be firmly and uniformly bedded throughout its entire length as required on the drawings or Section 9. Where the underground outlet foundation is in unstable soils, the bedding shall be as shown on the drawings or as otherwise required by the Engineer. Where the conduit is to be laid in rock, or rock is exposed at the trench bottom, the rock shall be removed at least two inches below the invert grade to allow for compacted bedding under the conduit.

PLACEMENT. Debris inside of pipes and tubing shall be removed prior to installation. The conduit ends shall be protected during placement. Similarly, all appurtenances, including trash guards and animal guards, shall be protected during installation to avoid damage. All underground outlets shall be laid to line and grade, and immediately covered with an approved blinding, envelope, or the required depth of filter material. No reversals in grade of the conduit are permitted, and in very hot climates no more than five percent stretch is allowed. Special precautions must be taken in hot weather to observe this stretch limit.

Flexible conduits, such as plastic pipe or tubing and bituminized fiber pipe, shall be installed, according to the requirements in ASTM-F-449, "Standard Recommended Practice for Subsurface Installation of Corrugated Thermoplastic Tubing for Agricultural Drainage or Water Table Control."

Earth backfill material shall be placed in the trench in a manner to ensure that the conduit does not become displaced and so that the filter and bedding material, after backfilling, meet the requirements of the plans and specifications.

8. BACKFILL

Initial backfill shall be of selected material that is free of rocks or other sharp-edged material that could damage the pipe. Earth backfill shall be placed in the trench in such a manner that the conduit is not displaced, and that the filter and bedding materials are not contaminated or displaced. Unless otherwise specified, where the underground outlet is laid under roads or at other designated locations, the backfill shall be placed in successive layers of not more than six inches, and each lift compacted before the subsequent layer. Backfill shall extend above the adjacent ground to allow for settlement and be well rounded over the trench.

Work areas shall be restored to their pre- construction condition or as otherwise required in the plans or Section 9.

9. ADDITIONAL CONDITIONS WHICH APPLY TO THIS PROJECT ARE:

USDA United States Department of Agriculture

Natural Resources Conservation Service
Practice Specification
Water Well (Code 642)

1. SCOPE

The work shall consist of furnishing materials and installing all components of the water well as outlined in this specification and the drawings.

2. MATERIALS

Casings: Casings shall be of steel, iron, stainless steel, copper alloys, plastic, fiberglass, or concrete of sufficient strength and durability consistent with the intended use of the water and the maximum anticipated differential head between the inside and outside of the casing. Unless otherwise set forth in Section 5 of this specification:

- Plastic casings made of acrylonitrile- butadiene-styrene (ABS), polyvinyl chloride (PVC), or styrene-rubber (SR) shall conform to material, dimensional and quality requirements specified in ASTM F 480.
- Filament-wound fiberglass casings (glass-fiber-reinforced-thermosetting- resin pipe, RTRP) may be used if material meets requirements specified in ASTM D 2996. Tests for long-term cyclic pressure strength, long-term static pressure strength, and short-term rupture strength as required in ASTM D 2996 are not needed because the pipe is to be used for well casing. Joints shall meet requirements specified in section 3.8, ASTM F 480.
- Fiberglass pressure pipe (also called reinforced polymer mortar pipe, RPMP, or fiberglass pipe with aggregate) shall meet or exceed requirements specified in ASTM D 3517.

Other casing materials shall be certified by the manufacturer or a registered Professional Engineer as being of adequate strength.

Joints: Well casing joints shall have adequate strength to carry the load due to the casing length and still be watertight or shall be mechanically supported during installation to maintain joint integrity. Such mechanically supported casings shall terminate on firm material that can adequately support the casing weight.

Screen: Well screens shall be constructed of commercially manufactured screen sections, well points, or field-perforated sections.

Perforation by any method is allowable provided the following provisions can be met:

- For uniform size aquifer material, screen openings are smaller than the average diameter of aquifer material.
- For non-uniform aquifer material, screen openings are smaller than 60 percent of the aquifer material.
- Screen openings, for filter/gravel pack must exclude at least 85 percent of the filter pack material.

- Size the length and open area of the screen to keep entrance velocity or shear stress below the threshold for erosion of filter pack particles and transport into the well.
- Casing must not be functionally weakened or deformed.

Gravel Pack: If gravel pack is used, it shall have the gradation and thickness specified in Section 5, or as shown on the drawings.

If acceptable *filter materials are unavailable*, use a commercially manufactured, pre-packed well screen. A pre-packed well screen consists of inner and outer screens that contain the engineered filter material. The material must meet the following quality criteria:

- Less than five percent fines (the proportion that passes the number 200 sieve);
- Predominantly rounded, dense, siliceous materials.
- No angular particles, such as crushed rock, or flat particles, such as mica.
- No earthy or soft materials, such as clay, shale, silt, gypsum, or anhydrite.
- No organic matter, no other impurities, or metallic substances.
- No material soluble in hydrochloric acid, such as limestone.

3. EQUIPMENT

The installer shall provide and operate all equipment necessary to install the well in a safe manner. The operator shall have a Water Well Driller's License and a Drilling Rig Permit, issued by the PA Geological Survey, for the equipment used on the site.

4. INSTALLATION

Drilled, jetted, bored, and driven wells shall be sufficiently round, straight, and of adequate diameter, to permit satisfactory installation of inlet, well casing, filter pack, and annular seal, and passage of tremie pipe (including couplings), if used. Hard rock formations or physically stable geologic materials may not require casing except for the uppermost 10 feet. However, casing shall be installed to seal out undesirable surface or shallow groundwater, and to support the side of the hole through unstable earth materials.

If drilling encounters erodible, friable, or otherwise unstable material, install watertight, grouted casing throughout, with the exception of the intake portions.

Provide a watertight seal in the annulus of all well casing. Acceptable sealants include mortar containing expansive hydraulic cement (ASTM C 845), bentonite-based grout, bentonite chips and pellets, sand- cement grout, neat cement, or concrete. The length of the grout seal shall be no less than 10 feet, and not less than the minimum specified in state or locally applicable construction codes.

If one or more zones are encountered that produce water of unacceptable quality, use grout or packers to prevent comingling of waters or cross-contamination of aquifers. Provide a packer, or similar retaining device, or a sealant between the casing and the less pervious material overlying the aquifer of artesian wells. Provide a similar

positive seal to separate water bearing zones where co- mingling of waters is undesirable.

For artesian conditions, seal the confining geologic units directly above and below the aquifer in such a manner as to retain its confining pressure.

Casing shall extend from above the ground surface down through unstable earth materials to an elevation of at least 2 feet into stable material or to the top of the screen.

If casing extends to the bottom of the drill hole, install a watertight end cap or grout seal to prevent entry of geologic material into the well from the bottom.

When the design requires telescoped screen assemblies, install one or more sand-tight seals between the top of the telescoped screen assembly and the casing. Upon completion, provide a suitably threaded, flanged, or welded cap or compression seal to prevent entry of contaminants into the well.

Well Development: After completion of well construction, ensure that the well is developed. Well development is required regardless of whether the well is finished in unconsolidated materials or hard rock aquifers. Use one or more development techniques to effectively loosen and remove silt, fine sand, drill cuttings, drilling muds, or additives deposited by the drilling operation on the uncased borehole face and in adjacent portions of the aquifer. For screened zones, the development technique must collapse sand bridges and remove fines outside the screen. Following the development process, remove accumulated sediment at the bottom of the well bore by bailing or pumping.

Pump the well at approximately 120 percent of the anticipated normal production rate until suspended sediment and associated turbidity clears. Do not use the permanent pump to conduct any well development work.

Unless otherwise set forth in Section 5, wells to be completed without a filter pack in unconsolidated granular aquifers shall be developed following guidance provided in ASTM D 5521, *Standard Guide for Development of Ground-Water Monitoring Wells in Granular Aquifers.*

The method shall be selected based on geologic character of the aquifer, type of drilling rig, and type of screen.

Aquifer Development: For massive, unfractured rock formations unresponsive to well development procedures, the use of aquifer stimulation techniques may be used to improve well efficiency and capacity, if permitted in Section 5 of this specification.

Techniques may include dry ice, acidizing, explosives, or hydrofracturing, depending on the composition and structure of the formation, and as specified in Section 5.

Access Port: An access port with a minimum diameter of 0.5 inch shall be installed to allow for unobstructed measurement of depth of the water surface, or for a pressure gage for measuring shut-in pressure of a flowing well. Access ports and pressure gages or other openings in the cover shall be sealed or capped to prevent entrance of surface water or foreign material into the well. Removable caps are acceptable as access ports.

Wellhead Protection: Surface runoff and drainage that might reach the wellhead from areas used by livestock or other contaminant sources shall be diverted away from the well.

The ground surface around the well shall be graded away from the well for a distance of at least five feet in all directions. Low points where water can puddle on the surface shall be eliminated.

If the well water is intended for human consumption, the casing shall be surrounded at the ground surface by a 4-inch-thick concrete slab extending at least 2 feet in all directions.

If the top of the well casing is subject to flooding from surface water, either of two methods shall be used to prevent floodwater from entering the well: (1) the well cap shall be water tight and equipped with a vent that extends two feet above the 100-year flood level, or (2) the well casing shall be extended to two feet above the 100-year flood level.

Disinfection: Wells shall be disinfected immediately following their construction or repair to neutralize any contamination from equipment, material, or surface drainage introduced during construction. The disinfection process shall comply with all local or state requirements.

Prior to final chemical disinfection, remove foreign substances, such as grease, soil, sediment, joint dope, and scum from the well and near the wellhead. Clean all pump parts before placing them into the well.

Disinfect the well using a chlorine compound at a concentration of no less than 50 mg/L (100 ppm) available chlorine in solution to treat the entire well.

Water Quality Testing: Sampling and testing shall comply with all applicable federal, state, and local requirements. These requirements vary according to the water quality parameters associated with the intended use(s) of the water. Test well water according to the *Construction Specification for Groundwater Testing (PA355)*.

Well Performance Testing. After completion of well construction and the water level is stable, conduct a pump test to determine specific capacity and dynamic water level. Wait no less than 24 hrs. after well development is completed and the water level has stabilized, to conduct a pumping test for determining specific capacity and dynamic water levels. Refer to NRCS 210-NEH-631 and 210-NEH, Part 650, Chapter 12, Section 650.1203, "Wells" for guidance on conducting, recording, and analyzing pumping tests. Discharge water a minimum of 300 feet from the well and in such a way that reduces erosion to the land surface and prevents potential artificial recharge during the test. Record the length of test and pumping rate.

Documentation: The well driller shall provide to the landowner and the PA-DCNR Topographic and Geological Survey copies of the water well completion report.

5. ADDITIONAL CONDITIONS WHICH APPLY TO THIS PROJECT ARE:

E. DRAWINGS

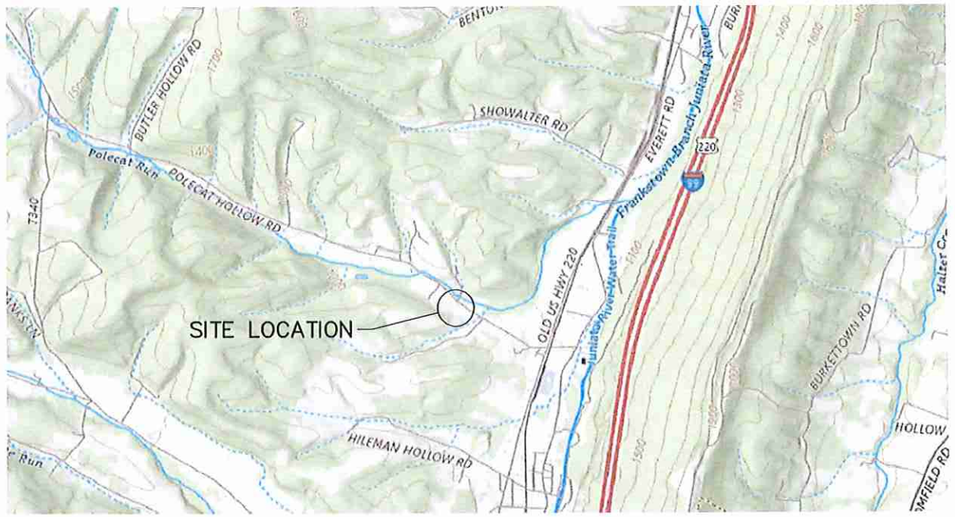
Larson Design Group

CONSTRUCTION PLAN SET

EYLER FARM

129 EYLER LANE, EAST FREEDOM, PA 16637

6403-127



GENERAL NOTES:

1. ALL FEDERAL, STATE, AND LOCAL LAWS, RULES AND REGULATIONS GOVERNING THE CONSTRUCTION OF THIS FACILITY SHALL BE STRICTLY FOLLOWED. THE OWNER OR OPERATOR IS RESPONSIBLE FOR OBTAINING ALL CONSTRUCTION PERMITS.
2. ANY APPLICABLE PA DEP GENERAL PERMITS (GP'S) REQUIRED FOR THIS PROJECT MUST BE ACQUIRED PRIOR TO START OF CONSTRUCTION.
3. OSHA REGULATIONS SHALL BE FOLLOWED AT ALL TIMES.
4. IT IS THE RESPONSIBILITY OF THE EXCAVATING CONTRACTOR TO COMPLY WITH PA ACT 187 (1996) AND ALL OF IT'S REVISIONS BEFORE PERFORMING ANY EXCAVATION. THE PA ONE CALL PHONE NUMBER IS 1-(800)-242-1776. THE DESIGN PA ONE CALL SERIAL NUMBER IS **20252681141** DATED **9/25/2025** AND IS TO BE USED FOR REFERENCE ONLY. EACH EXCAVATOR IS RESPONSIBLE FOR COMPLETING THEIR OWN ONE CALL FOR LIABILITY PURPOSES.
5. A MEETING BETWEEN THE LANDOWNER/OPERATOR, CONTRACTOR, SPONSORING AGENCY AND ENGINEER IS REQUIRED PRIOR TO STARTING ANY CONSTRUCTION.
6. A COPY OF THE SPECIFICATIONS AND DRAWINGS SHALL BE ON SITE DURING ALL PHASES OF CONSTRUCTION.
7. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING ALL MEASURES NECESSARY TO PROTECT WORK IN PROGRESS FROM ENVIRONMENTAL CONDITIONS SUCH AS TEMPERATURE EXTREMES, STORM WATER AND GROUND WATER.

DRAWING SHEET INDEX:

STRUCTURAL DRAWING SET

BLAIR COUNTY CONSERVATION DISTRICT

1407 BLAIR STREET

HOLLIDAYSBURG, PA 16648

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ADAM WINEY
ENGINEER
PE098495
3/23/2026

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3000 WESTINGHOUSE DRIVE
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MARK	DATE	COMMENTS
0	09-03-2025	DEP SUBMISSION
1	10-15-2025	I&E SUBMISSION
2	01-09-2026	FINAL DRAFT REVIEW
3	02-19-2026	FINAL SUBMISSION
4	03-23-2026	CONSTRUCTION PLAN SET

BLAIR COUNTY CONSERVATION DISTRICT
1407 BLAIR ST.
HOLLIDAYSBURG, PA 16648

EYLER FARM
129 EYLER LANE
EAST FREEDOM, PA 16637

COVER SHEET

Date: 03-23-2026

Project No.: 6403-127

Sheet No.: G-001

CONSTRUCTION PLAN SET

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LEGEND

	EXISTING	PROPOSED
FEATURES TEXT	*FEATURES TEXT*	**FEATURES TEXT**
PROPERTY LINE		
RIGHT–OF–WAY LINE		
EASEMENT LINE		
CONTOUR LINE	*100*	100
CENTER LINE OF ROAD		
BUILDING SETBACK		
BUILDING LINE		
FENCE LINE		
EDGE OF PAVEMENT		
GRAVEL EDGE		
CONCRETE CURB		
CONCRETE SIDEWALK		
SIGN		
BENCHMARK		
DITCH/SWALE/DIVERSION/WATERWAY		
DRAINAGE LINE, MANHOLE & CB	MH	MH
SANITARY SEWER & MANHOLE	MH S S	MH S S
WATER MAIN & VALVE	WV W W	WV W W
SEWER FORCE MAIN	FM FM	FM FM
GAS MAIN & VALVE	GV G G	GV G G
UNDERGROUND ELECTRIC	UE UE	E E
UNDERGROUND CABLE TV	CTV CTV	
OVERHEAD UTILITIES & POLE	OH OH	OH OH
UNDERGROUND TELEPHONE	UT UT	T T
GUIDE RAIL		
GRAVEL / CRUSHED STONE		
BITUMINOUS PAVEMENT		

OTHER

12" COMPOST FILTER SOCK	CS-12 CS-12
LIMIT OF DISTURBANCE	LOD LOD
SOILS BOUNDARY	
SOIL TYPE	HhC2
DRAINAGE SWALE PATH	
GUTTER SLOPED DIRECTION	
ROOF GUTTERS	
DOWNSPOUT LOCATIONS	
PERFORATED DRAINS	
OUTLET PIPES	
ROCK CONSTRUCTION ENTRANCE	RCE
TOPSOIL STOCKPILE	TOPSOIL STOCKPILE

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BLAIR COUNTY CONSERVATION DISTRICT
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DRAWING LEGEND

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ADAM WINEY
ENGINEER
PE098495

Date: 03-23-2026
Project No.: 6403-127
Sheet No.: **G-002**

CONSTRUCTION PLAN SET

OWNER RESPONSIBILITIES

1. THE OWNER IS RESPONSIBLE FOR ENSURING THAT ALL LIVESTOCK ARE REMOVED FROM THE WORK SITE AND THAT LIVESTOCK WILL REMAIN EXCLUDED FROM THE WORK SITE UNTIL THE PROJECT HAS RECEIVED FINAL CERTIFICATION AND IS APPROVED FOR USE.
2. THE OWNER IS TO PROVIDE REASONABLE ACCESS TO THE WORK SITE.

EXCAVATION NOTES

1. NO EXCAVATION SHALL BEGIN UNTIL THE EXCAVATOR HAS COMPLIED WITH ALL PA ONE–CALL REQUIREMENTS AND ANY UTILITY COMPANY RESPONSES.
2. ALL EROSION AND SEDIMENT PRACTICES SHALL BE INSTALLED PRIOR TO BEGINNING EXCAVATION.
3. OSHA STANDARDS SHALL BE FOLLOWED FOR ALL EXCAVATION.
4. TOPSOIL SHALL BE STRIPPED AND STOCKPILED TO BE RE–DISTRIBUTED WHEN THE PROJECT IS COMPLETE.
5. ALL MANURE–LADEN SOIL SHALL BE REMOVED AND SPREAD ACCORDING TO THE LANDOWNER'S NUTRIENT MANAGEMENT PLAN.
6. THE SITE SHALL BE EXCAVATED UNTIL GOOD, STABLE SOIL IS ENCOUNTERED,.
7. IF SEEPS ARE ENCOUNTERED DURING EXCAVATION, PROVISIONS MUST BE MADE TO DRAIN THE SEEP. TILING, CLEAN 2B–DRAIN STONE AND AN OUTLET MAY BE NEEDED. IF THE SEEP IS NEXT TO A STRUCTURAL WALL, INSTALL CLEAN 2B–DRAIN STONE FROM THE FOOTER DRAIN UP TO THE SEEP ELEVATION.
8. IF ROCK REFUSAL IS MET BEFORE DESIGN SUB–GRADE, CHANGES IN DESIGN ELEVATIONS WILL REQUIRE DESIGNER AND LANDOWNER APPROVAL.
9. EXCESS MATERIAL SHALL BE DISPOSED OF AS DIRECTED BY THE LANDOWNER AND THE SITE INSPECTOR.
10. A UNIFORM LAYER OF 2B–STONE (AASHTO #57), 4" THICK SHALL BE PLACED ABOVE SUB–GRADE TO BED ALL CONCRETE. STONE DEPTH TO BE MEASURE AFTER COMPACTION. STONE SHALL NOT BE PLACED UNTIL EARTHEN SUB–GRADE ELEVATION AND COMPACTION IS APPROVED BY SITE INSPECTOR.
11. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING ALL NECESSARY MEASURES TO PROTECT WORK IN PROGRESS FROM ENVIRONMENTAL CONDITIONS SUCH AS TEMPERATURE EXTREMES AND STORM WATER.
12. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING THE CONSTRUCTION SITE UNTIL THE WORK HAS BEEN COMPLETED AND CERTIFIED BY THE DESIGN ENGINEER. THIS INCLUDES DE–WATERING THE SITE AS NECESSARY, AS WELL AS PREVENTING UP SLOPE RUNOFF FROM ENTERING THE WORK AREA. IT IS STRONGLY RECOMMENDED THAT ALL PLANNED DIVERSIONS OR SWALES BE INSTALLED FIRST AND ALL PERIMETER DRAIN OUTLETS BE INSTALLED BEFORE STONE OR CONCRETE IS PLACED, IF POSSIBLE.
13. FINAL GRADING SHALL PROVIDE POSITIVE DRAINAGE AWAY FROM ALL STRUCTURES. SWALES SHALL BE SHAPED AS NECESSARY ALONG THE HEAVY USE AREA AND MANURE STORAGE TO DIRECT STORM WATER AWAY FROM THE STRUCTURES.

EARTHFILL NOTES

1. EARTHEN BACKFILL SHALL BE PLACED IN A MANNER THAT PREVENTS DAMAGE TO THE STRUCTURES AND ALLOWS THE STRUCTURES TO ASSUME THE LOADS FROM THE EARTH BACKFILL GRADUALLY AND UNIFORMLY. THE HEIGHT OF THE EARTH BACKFILL ADJACENT TO THE STRUCTURE SHALL BE INCREASED AT THE SAME RATE ON ALL SIDES OF THE STRUCTURE.
2. BACKFILL SHALL BE PLACED IN EVEN, HORIZONTAL LAYERS. IF NECESSARY, OVER–EXCAVATE TO AN APPROXIMATELY LEVEL SURFACE AND BUILD SUBGRADE IN EVENLY COMPACTED, HORIZONTAL LIFTS OF SPECIFIED THICKNESS.
3. BACKFILL SHALL BE PLACED AT OPTIMUM MOISTURE CONTENT. BACKFILLED MATERIAL SHALL HAVE ENOUGH MOISTURE SO THAT WHEN FORMED INTO A BALL, IT WILL NOT BREAK IF STRUCK SHARPLY WITH A PENCIL. BACKFILLING NEWLY POURED WALLS MAY NOT BEGIN UNTIL 14–DAYS AFTER THE FINAL CONCRETE PLACEMENT. COMPACT USING THE FOLLOWING EQUIPMENT AND LIFT THICKNESS:
   FOOTINGS AND STRUCTURE FLOOR:
   (3) PASSES OF SHEEPSFOOT OR VIBRATORY ROLLER IN 6–INCH LIFTS.
   WITHIN 3 FEET OF WALLS:
   (3) PASSES BY HAND COMPACTOR OR SMALL MANUALLY DIRECTED EQUIPMENT IN 6–INCH LIFTS. DO NOT USE ANY VIBRATORY EQUIPMENT WITHIN THIS AREA.
   BEYOND 3 FEET OF WALLS:
   *A ROLLER CAN BE USED BEYOND 3 FEET OF THE WALL WITHOUT THE VIBRATORY FUNCTION ON. DO NOT USE ANY VIBRATORY EQUIPMENT WITHIN A DISTANCE EQUAL TO THE WALL HEIGHT.
   (3) PASSES BY TRACK EQUIPMENT (>4,000 LBS) IN 6–INCH LIFTS.
   (3) PASSES BY RUBBER TIRED EQUIPMENT IN 6–INCH LIFTS.
   (3) PASSES BY A ROLLER IN 6–INCH LIFTS.
4. AVOID BACKFILL CONTAINING ROCKS OR CLODS GREATER THAN 3" DIAMETER, DEBRIS, ROOTS, FROZEN SOIL, OR OTHER UNSUITABLE MATERIAL AS DETERMINED BY THE SITE INSPECTOR.
5. INCORPORATE 6" OF TOPSOIL INTO THE FINAL SURFACE OF THE EARTHFILL. ALL DISTURBED AREAS WILL BE SEEDED AND MULCHED ACCORDING TO THE CRITICAL AREA PLANTING SPECIFICATION AND THE E&S PLANS IN THE DRAWING SET.

PIPE NOTES

1. ALL PIPES SHALL MEET MINIMUM MATERIAL SPECIFICATIONS:
   1.1. SCH 40 PVC SHALL MEET ASTM–D1785
   1.2. SDR–35 SHALL MEET ASTM–D3034
   1.3. CORRUGATED POLYETHYLENE TUBING SHALL MEET ASTM–F667 OR AASHTO–M252
      1.3.1 USE ASTM–667 PIPE AND FITTINGS WHERE MAXIMUM COVER DOES NOT EXCEED 9.8'.
      1.3.2 USE AASHTO–M252 PIPE AND FITTINGS WHERE COVER EXCEEDS 9.8'.
      1.3.3 ALL CORRUGATED POLYETHYLENE TUBING SHALL BE INSTALLED SO BEDDING MATERIAL IS WORKED IN AROUND THE PIPE WITH HAND TOOLS. HAUNCHING AND INITIAL BACKFILL MATERIAL SHALL BE PLACED CAREFULLY TO ENSURE THE PIPE IS ADEQUATELY SUPPORTED.
2. ALL FITTINGS FOR SCHD 40 AND SDR PIPE SHALL BE PRESSURE–RATED, WATERTIGHT AND MEET MINIMUM MATERIAL SPECIFICATIONS OF PIPE.
3. ALL FITTINGS FOR F667/M252 PIPE MUST MEET THE MINIMUM MATERIAL SPECIFICATIONS OF THE PIPE. ALL FITTINGS AND PIPE CONNECTIONS MUST BE MADE WITH MANUFACTURER SUPPLIED COMPONENTS.
4. PIPES SHALL BE INSTALLED TO SPECIFIED DEPTH AND TO MINIMUM DESIGN GRADE.
5. TRENCHES FOR PIPELINES SHALL BE FREE OF ROCKS AND SHARP–EDGED MATERIALS. A SUPPLY OF AASHTO #57 BEDDING, OR OTHER SUITABLE GRANULAR MATERIAL, SHALL BE AVAILABLE TO BED PIPELINES IN UNSTABLE SOILS OR AS DIRECTED BY THE SITE INSPECTORS.
6. PIPES SHALL BE BACKFILLED AS SHOWN ON DESIGN DETAILS. ANY PIPE TO BE PLACED IN A TRAFFIC AREA IS TO BE BEDDED AS PER DESIGN DETAILS AND BACKFILLED TO THE SURFACE WITH 2A MODIFIED OR 2RC AGGREGATE. ANY PIPE NOT SPECIFICALLY DETAILED MAY BE BACKFILLED WITH MOIST EARTH, FREE OF LARGE CLODS OR ROCKS, AND HAND COMPACTED IN 6–INCH LIFTS. DO NOT DRIVE MACHINERY OVER RECENTLY BACKFILLED PIPES. MOUND BACKFILL 10% OF TRENCH DEPTH TO ALLOW FOR SETTLEMENT.

GEOTEXTILE NOTES

1. ACCESS ROADS WITH NORMAL FARM EQUIPMENT: USE NON–WOVEN GEOTEXTILE WITH A MINIMUM TENSILE STRENGTH OF 200 LBS.
2. ACCESS ROADS FOR HEAVY EQUIPMENT: USE NON–WOVEN GEOTEXTILE WITH A MINIMUM TENSILE STRENGTH OF 315 LBS.
3. ANIMAL WALKWAYS: USE NON–WOVEN GEOTEXTILE WITH A MINIMUM TENSILE STRENGTH OF 160 LBS.
4. UNDER CONCRETE/OVER BEDDING STONE: GEOTEXTILE SHALL BE NON–WOVEN WITH AN APPARENT OPENING SIZE (AOS) BETWEEN 20 AND 100, INCLUSIVE.
5. GEOTEXTILE INSTALLED ON SLOPES GREATER THAN 8% SHALL BE NON–WOVEN.
6. GEOTEXTILE TYPE INSTALLED ON ACCESS ROADS AND WALKWAYS OVER WET SUB–GRADE AREAS WILL BE DETERMINED BY EXPECTED USAGE.
7. ALLOW 1 FT OVERLAP BETWEEN ADJACENT PANELS OF GEOTEXTILE WHERE APPLICABLE.

ADDITIONAL PROJECT SPECIFIC NOTES

1. WETLAND MUST BE FENCED OUT WITH CONSTRUCTION FENCING PER DEP REQUIREMENTS.

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MARK	DATE	COMMENTS
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BLAIR COUNTY CONSERVATION DISTRICT
1407 BLAIR ST.
HOLLIDAYSBURG, PA 16648

EYLER FARM
129 EYLER LANE
EAST FREEDOM, PA 16637

GENERAL CONSTRUCTION NOTES

Date: 03-23-2026
Project No.: 6403-127
Sheet No.: G-003

CONSTRUCTION PLAN SET

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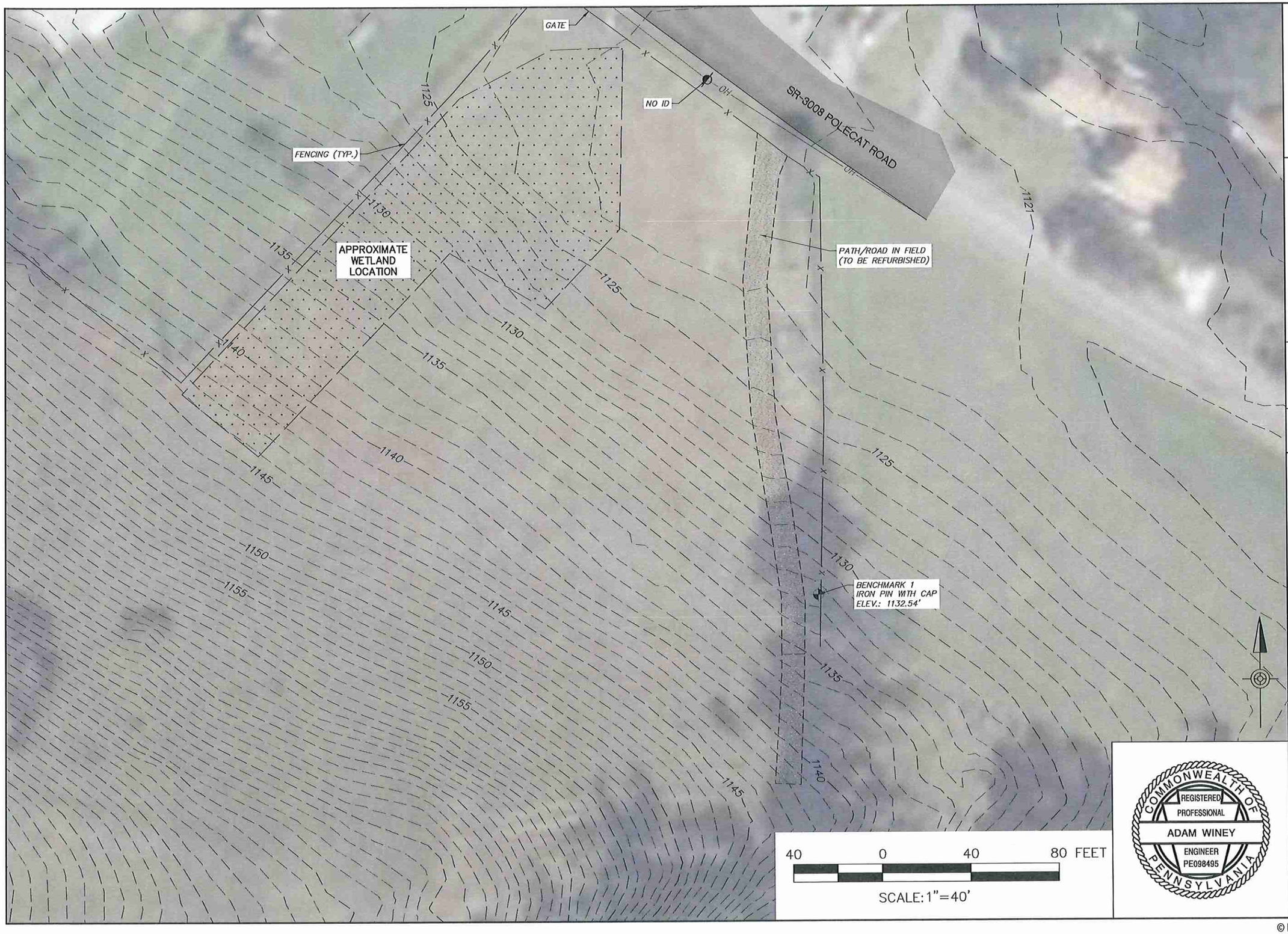

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BLAIR COUNTY CONSERVATION DISTRICT
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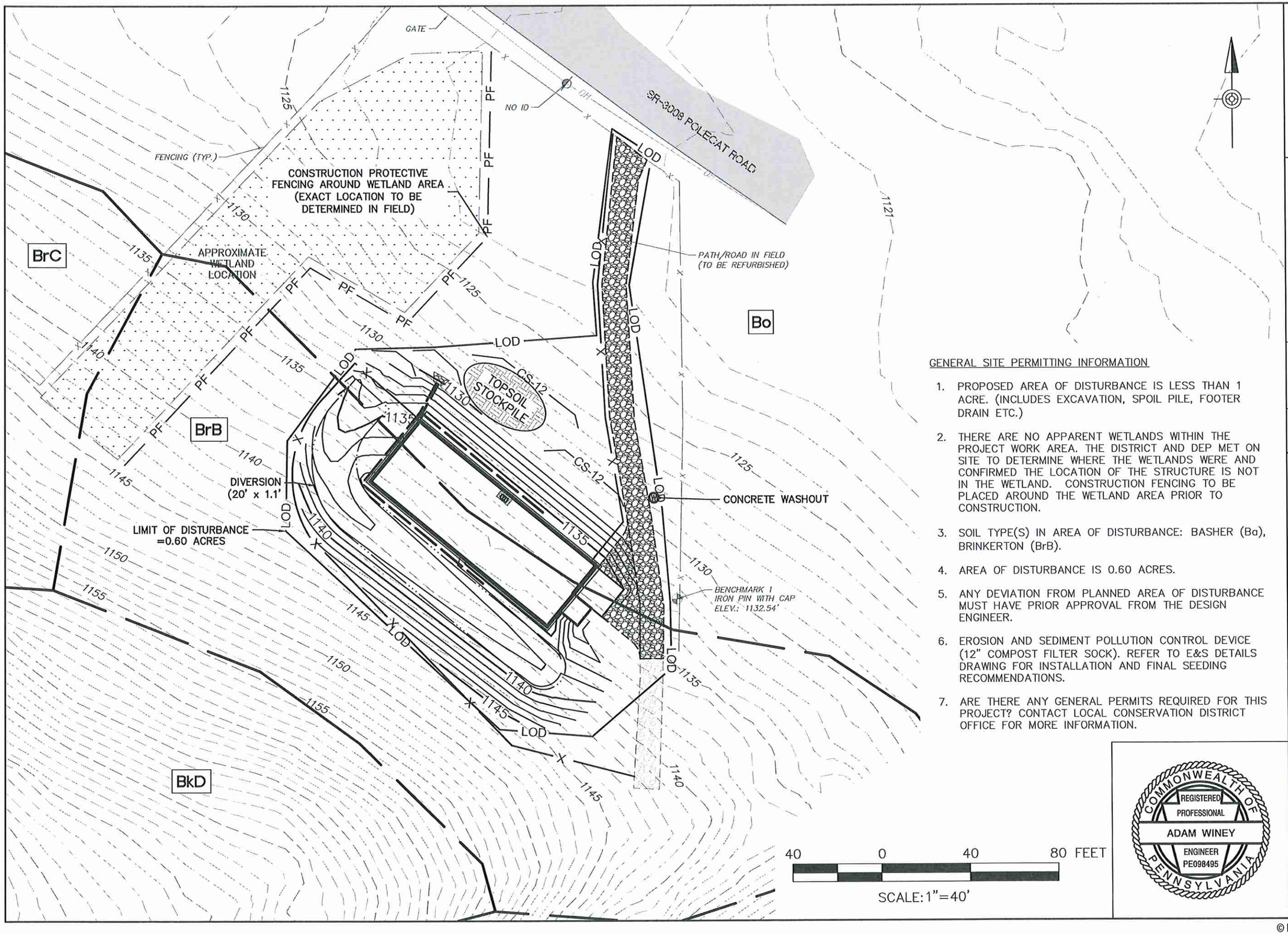
EXISTING SITE PLAN VIEW

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ADAM WINEY
ENGINEER
PE098495

Date: 03-23-2026
Project No.: 6403-127
Sheet No.: **V-101**

CONSTRUCTION PLAN SET



GENERAL SITE PERMITTING INFORMATION

1. PROPOSED AREA OF DISTURBANCE IS LESS THAN 1 ACRE. (INCLUDES EXCAVATION, SPOIL PILE, FOOTER DRAIN ETC.)
2. THERE ARE NO APPARENT WETLANDS WITHIN THE PROJECT WORK AREA. THE DISTRICT AND DEP MET ON SITE TO DETERMINE WHERE THE WETLANDS WERE AND CONFIRMED THE LOCATION OF THE STRUCTURE IS NOT IN THE WETLAND. CONSTRUCTION FENCING TO BE PLACED AROUND THE WETLAND AREA PRIOR TO CONSTRUCTION.
3. SOIL TYPE(S) IN AREA OF DISTURBANCE: BASHER (Ba), BRINKERTON (BrB).
4. AREA OF DISTURBANCE IS 0.60 ACRES.
5. ANY DEVIATION FROM PLANNED AREA OF DISTURBANCE MUST HAVE PRIOR APPROVAL FROM THE DESIGN ENGINEER.
6. EROSION AND SEDIMENT POLLUTION CONTROL DEVICE (12" COMPOST FILTER SOCK). REFER TO E&S DETAILS DRAWING FOR INSTALLATION AND FINAL SEEDING RECOMMENDATIONS.
7. ARE THERE ANY GENERAL PERMITS REQUIRED FOR THIS PROJECT? CONTACT LOCAL CONSERVATION DISTRICT OFFICE FOR MORE INFORMATION.

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E&S SITE PLAN VIEW

Date: 03-23-2026
Project No.: 6403-127
Sheet No.: ES-101

CONSTRUCTION PLAN SET

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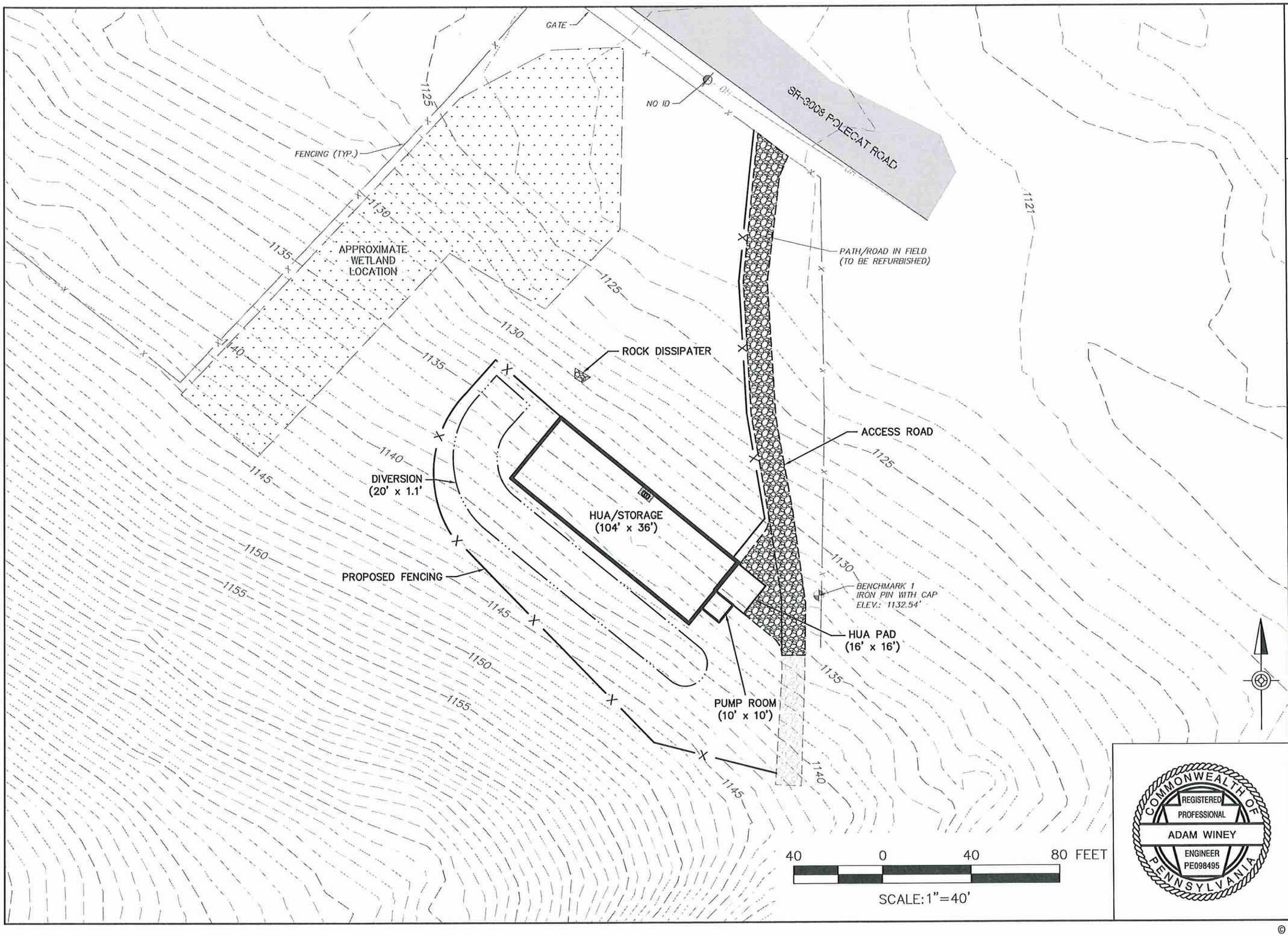

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4	03-23-2026	CONSTRUCTION PLAN SET
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0	09-03-2025	DEP SUBMISSION

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SITE PLAN VIEW

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ENGINEER
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Date: 03-23-2026
Project No.: 6403-127
Sheet No.: **CS-101**

CONSTRUCTION PLAN SET

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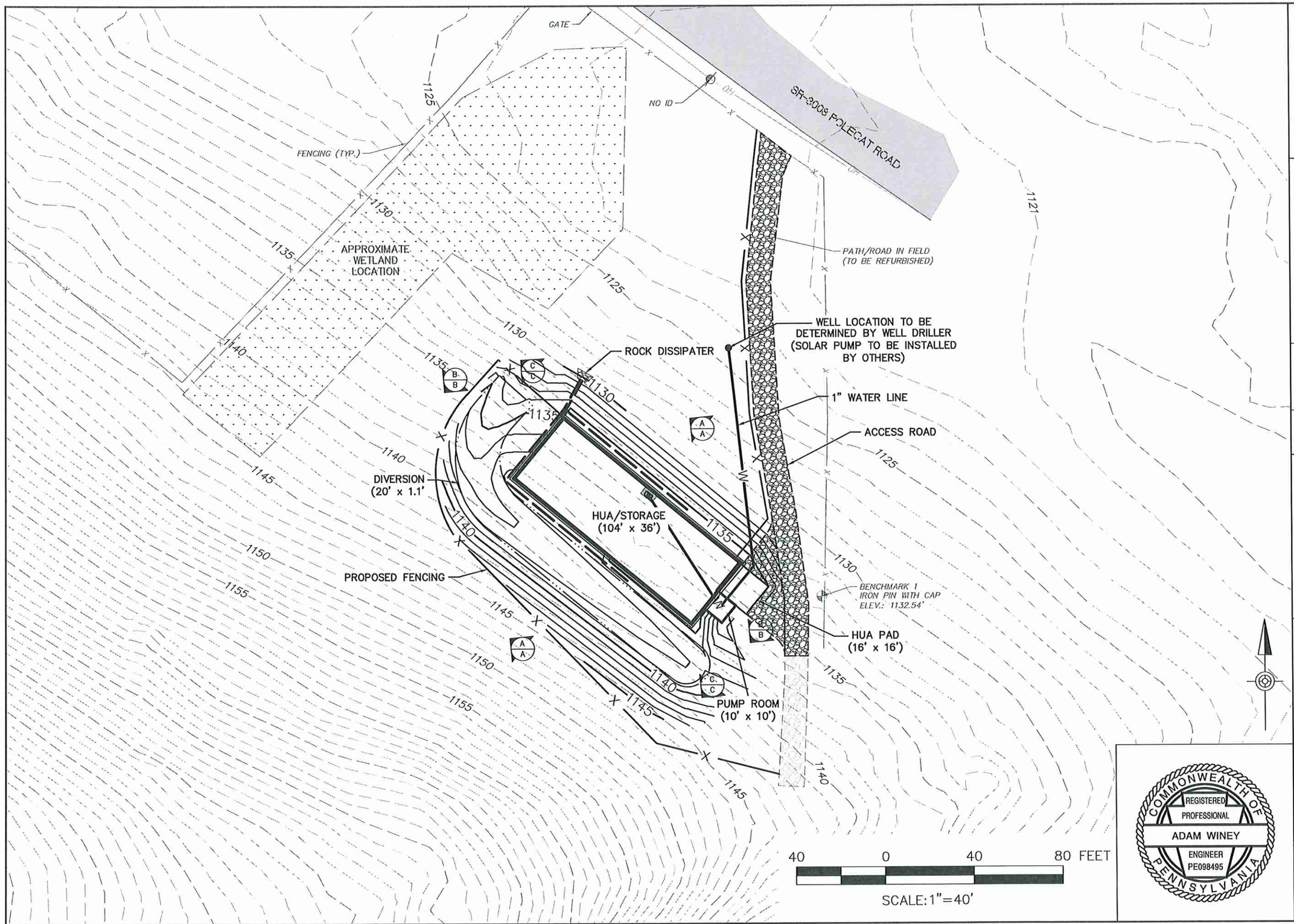

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GRADING PLAN VIEW

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Date: 03-23-2026
Project No.: 6403-127
Sheet No.: **CG-101**

CONSTRUCTION PLAN SET

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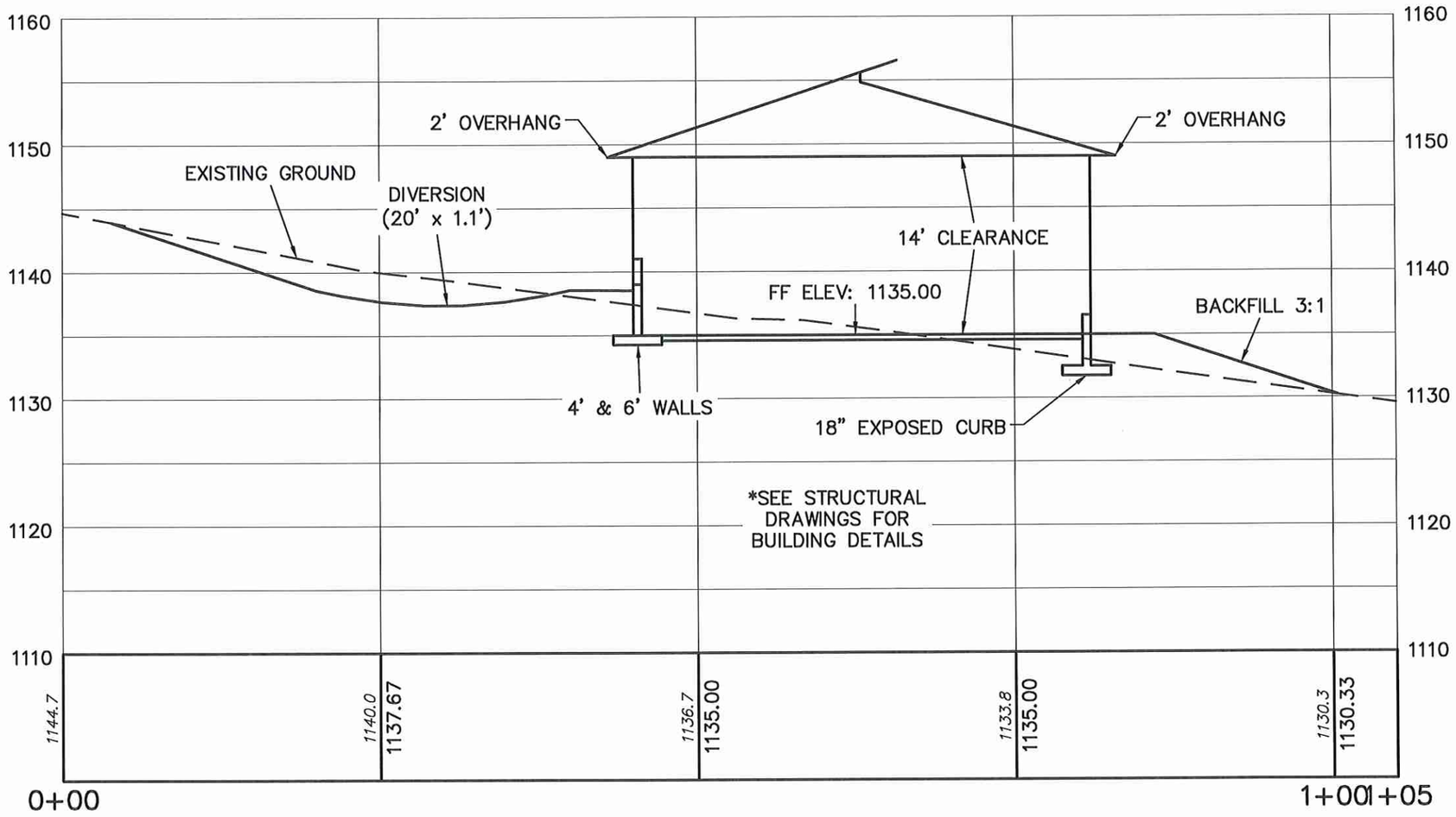

Alignment - A-A PROFILE

10 0 10 20 FEET

SCALE: 1"=10'

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STRUCTURE PROFILE: A-A

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Date: 03-23-2026
Project No.: 6403-127
Sheet No.: **CG-102**

CONSTRUCTION PLAN SET

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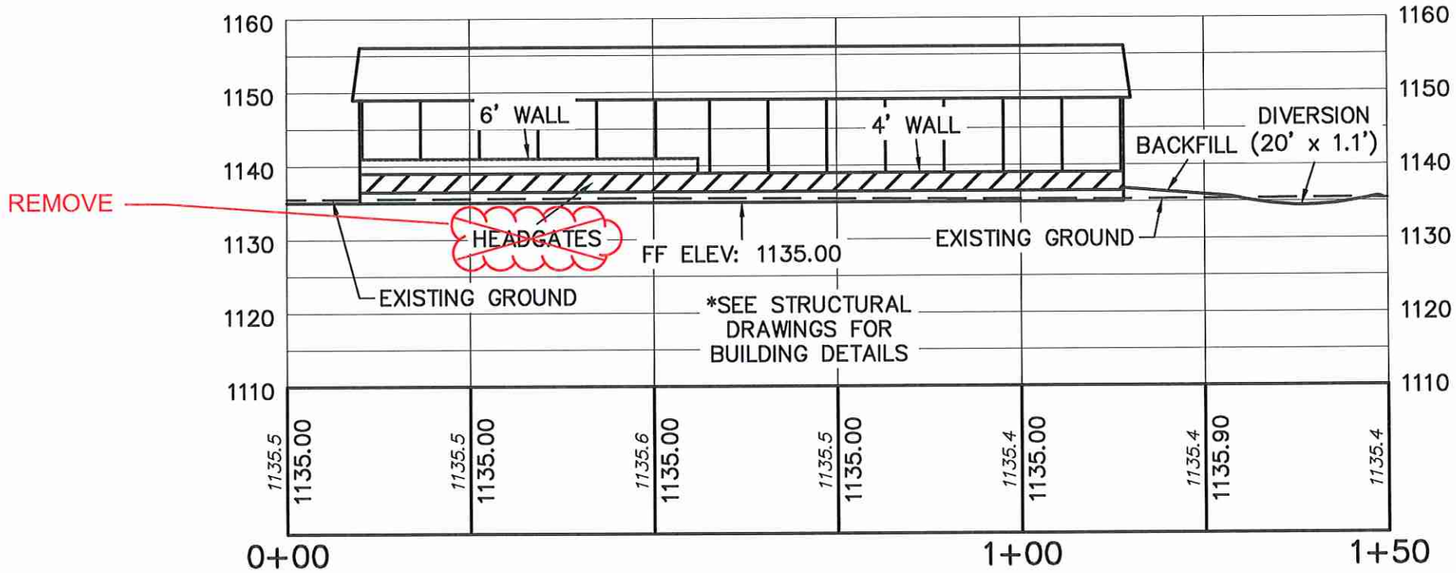
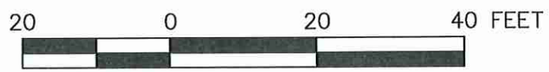


Alignment - B-B PROFILE



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STRUCTURE PROFILE: B-B

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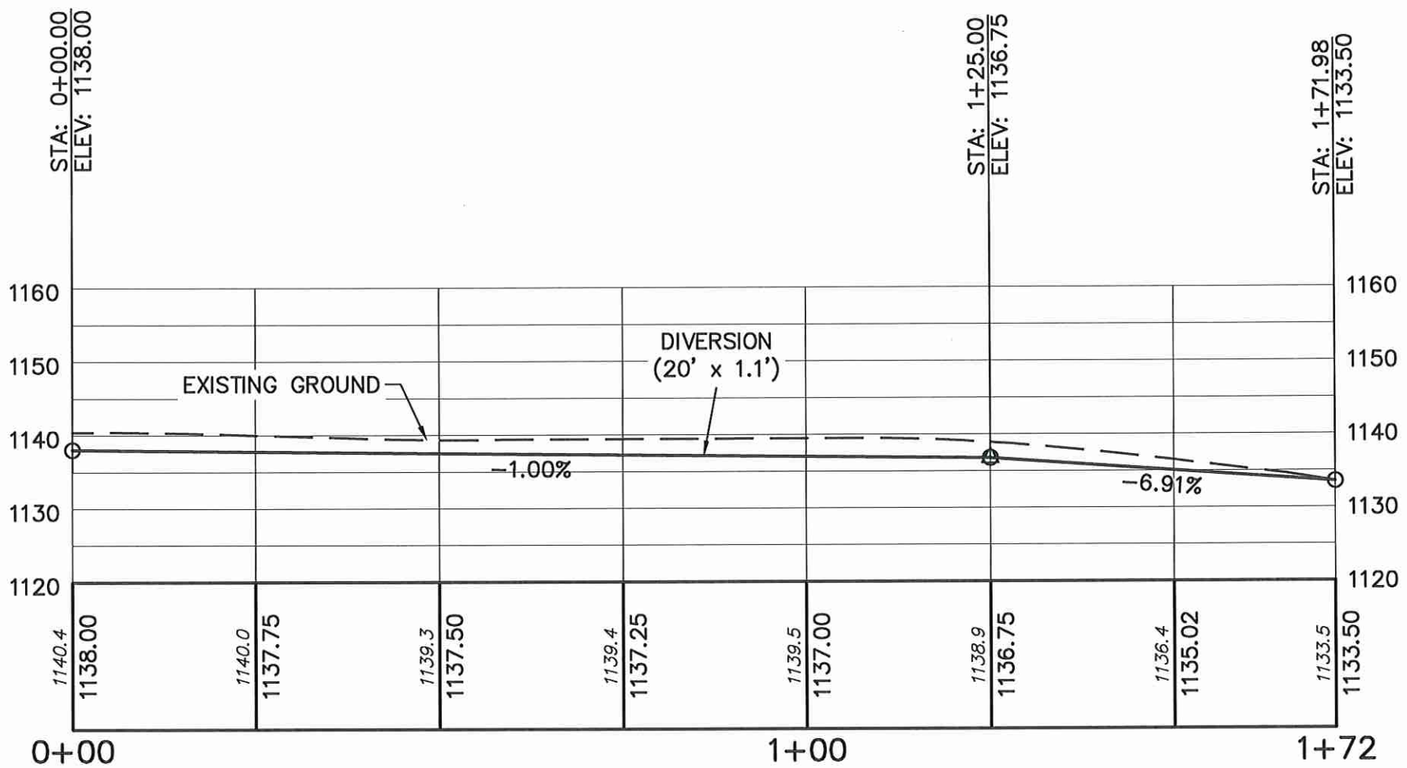
Project No.: 6403-127
Sheet No.: **CG-103**

CONSTRUCTION PLAN SET



DIVERSION PROFILE

20 0 20 40 FEET

SCALE: 1"=20'

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DIVERSION PROFILE: C-C

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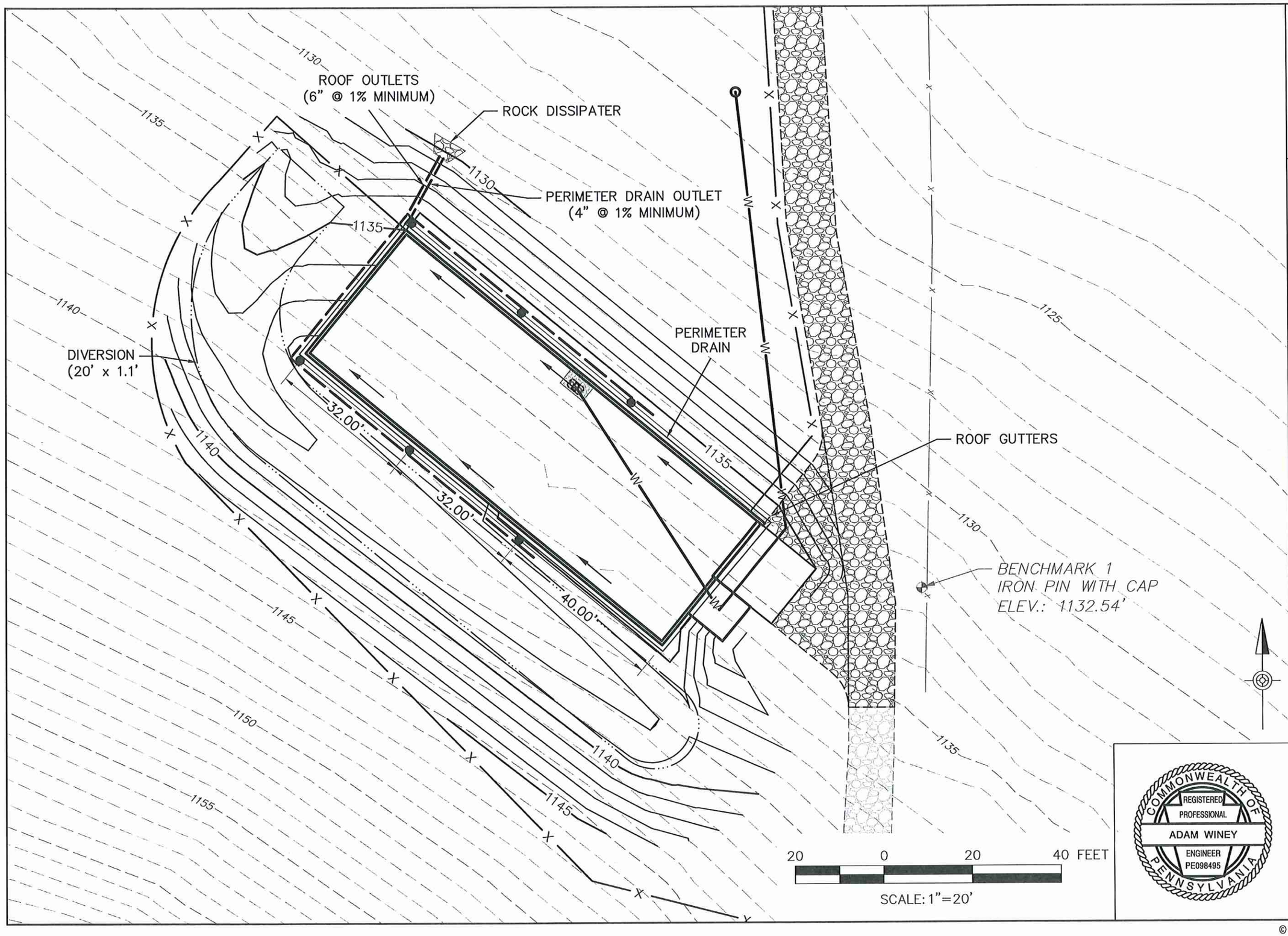
Date: 03-23-2026

Project No.: 6403-127

Sheet No.: **CG-104**

CONSTRUCTION PLAN SET



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STORM WATER CONTROL PLAN

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ADAM WINEY
ENGINEER
PE098495

Date: 03-23-2026
Project No.: 6403-127
Sheet No.: **CG-105**

CONSTRUCTION PLAN SET

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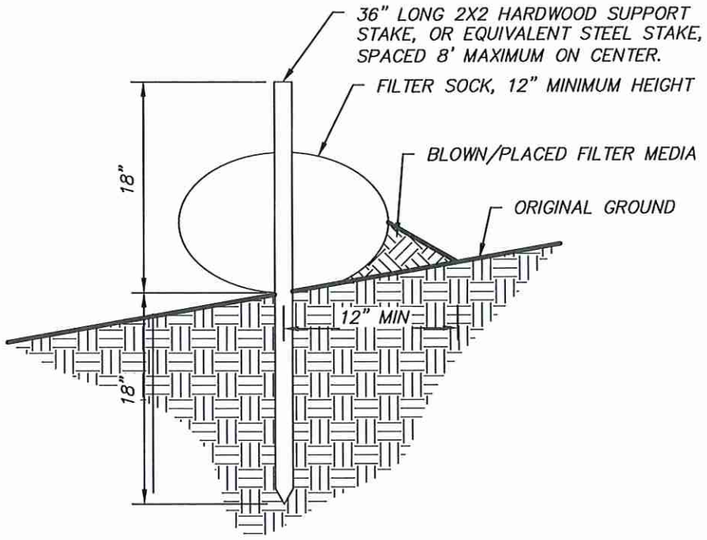
E&S POLLUTION CONTROL PLAN AND FINAL SEEDING RECOMMENDATIONS



NOTES:

1. FILTER SOCK SHALL BE INSTALLED DOWN SLOPE OF DISTURBED AREAS OF THE CONSTRUCTION SITE.
2. TRAFFIC SHALL NOT BE PERMITTED TO CROSS FILTER SOCKS.
3. FILTER SOCK SHALL BE PLACED AT LEVEL EXISTING GRADE. BOTH ENDS OF THE SOCK SHALL BE EXTEND AT LEAST 8' UP SLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.
4. STAKES MAY BE INSTALLED IMMEDIATELY DOWN SLOPE OF THE SOCK IS SO SPECIFIED BY THE MANUFACTURER
5. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES HALF THE ABOVE GROUND HEIGHT OF THE SOCK.
6. SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.
7. BIODEGRADABLE FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
8. UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.
9. ANY SECTION OF SILT FENCE WHICH HAS BEEN UNDERMINED OR TOPPED SHALL BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET.

SOIL PREPARATION

1. WHEN GRADING IS FINISHED, APPLY LIME AND FERTILIZER IN ACCORDANCE WITH SOIL TEST RECOMMENDATIONS.
2. IF SOIL TEST RESULTS ARE NOT AVAILABLE, APPLY 4 TON PER ACRE OF AGRICULTURAL GRADE LIMESTONE (@100% CCE) AND FERTILIZE AT THE RATE OF 1,000 LBS. OF 10–20–20 OR EQUIVALENT PER ACRE.
3. LIME AND ONE–HALF (½) THE AMOUNT OF THE FERTILIZER SHALL BE INCORPORATED 4 TO 6 INCHES INTO SOIL.
4. WORK ARE WITH CHISEL PLOW OR SIMILAR TYPE EQUIPMENT, MAKING SURE
   LIME AND FERTILIZER ARE WORKED WELL INTO THE SOIL.
5. FOLLOW WITH THE BALANCE OF FERTILIZER AND SEED.

SEEDING RECOMMENDATIONS

(FROM NRCS PA–342 CRITICAL AREA PLANTING PRACTICE SPECIFICATION)
THE SEED MIXTURE SHALL BE THE FOLLOWING OR SIMILAR IF APPROVED BY THE ENGINEER OF RECORD.

1. NURSE CROP(REQUIRED WITH EVERY PERMANENT SEED APPLICATION):
   - 1.1. OATS– 48 LBS/ACRE PLS
   - 1.2. WHEAT– 90 LBS/ACRE PLS
   - 1.3. ANNUAL RYE– 20 LNS/ACRE PLS

2. PERMANENT STABILIZATION:
   - 2.1. PERENNIAL RYE– 20 LBS/ACRE PLS
     PLUS
   - 2.2. TALL FESCUE– 60 LBS/ACRE PLS

NOTE:
THIS MIXTURE IS SUITABLE FOR FREQUENT MOWING. DO NOT CUT SHORTER THAN 4"

IF PARTIAL COMPLETION OF ANY PART OF THE PROJECT IS ACCOMPLISHED, AND THIS AREA WILL BE DISTURBED AGAIN BUT NOT FOR A PERIOD OF 20 DAYS OR MORE, THOSE AREAS MUST BE SEEDED WITH A TEMPORARY COVER–SEEDING.
TEMPORARY SEED AND MULCH WILL BE APPLIED AT THE FOLLOWING RATES

ANNUAL RYGRASS	40LBS/ACRE
WINTER RYE	168 LBS/ACRE
WINTER WHEAT	180 LBS/ACRE
SPRING OATS	96 LBS/ ACRE

PLANTING RECOMMENDATION

SEED CAN BE APPLIED WITH A DRILL OR BROADCAST SEEDER.
BAND SEEDING IS NOT PERMITTED.
IF BROADCAST, HARROW OR DISK LIGHTLY TO COVER SEEDING. (DOUBLE DRILLING GIVES BETTER DISTRIBUTION OF SEEDING AND HELPS TO SPREAD THE WATER WHILE PLANTS ARE SMALL. DRILL FIRST LENGTHWISE AND THEN CROSSWISE (IN A ZIG–ZAG PATTERN). OPTIMUM PLANTING TIME IS EARLY SPRING OR MID SUMMER.
AS SOON AS SEEDING IS FINISHED, MULCH WITH 3 TONS/ACRE OF HAY OR STRAW, MAKING A LAYER 1 TO 1.5 INCHES DEEP. SET DISK STRAIGHT AND GO OVER MULCH TO PRESS STRAW INTO THE SOIL.
TACKIFIERS CAN ALSO BE USED FOR ANCHORING MULCH.

THE EROSION AND SEDIMENTATION PLAN IS BASED ON THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL, TECHNICAL GUIDANCE NUMBER 363–2134–008 MARCH 2012.

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E&S DETAILS

Date: 03-23-2026
Project No.: 6403-127
Sheet No.: C-501

CONSTRUCTION PLAN SET

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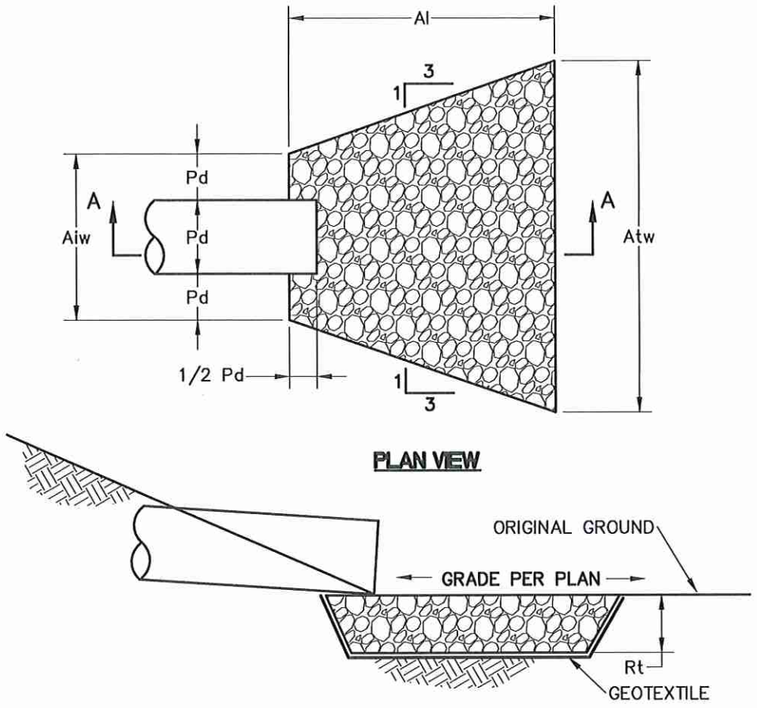


PLAN VIEW

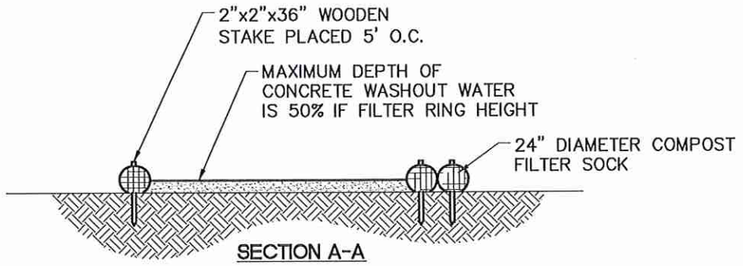
SECTION A-A

OUTLET NO.	PIPE DIA Pd (IN)	RIPRAP		APRON		
		SIZE R--	THICK. Rt (IN)	LENGTH Al (FT)	INITIAL WIDTH Aiw (FT)	TERMINAL WIDTH Atw (FT)
ALL	4-6	4	18	4	4	8

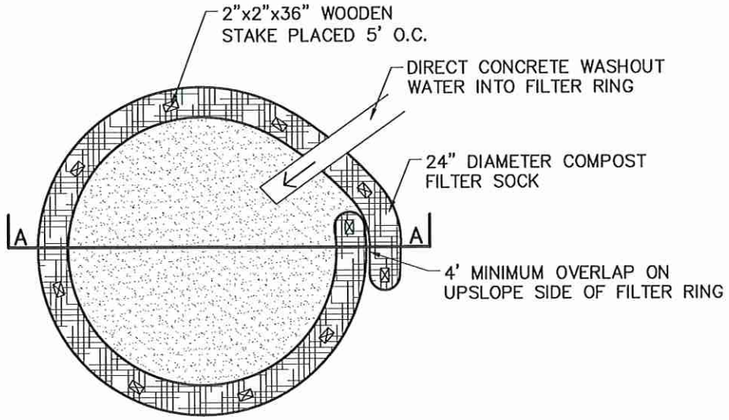
NOTES:
1. ALL APRONS SHALL BE CONSTRUCTED TO THE DIMENSIONS SHOWN. TERMINAL WIDTHS SHALL BE ADJUSTED AS NECESSARY TO MATCH RECEIVING CHANNELS.
2. ALL APRONS SHALL BE INSPECTED AT LEAST WEEKLY AND AFTER EACH RUNOFF EVENT. DISPLACED RIP-RAP WITHIN THE APRON SHALL BE REPLACED IMMEDIATELY.
3. EXTEND RIP-RAP ON BACK SIDE OF APRON TO AT LEAST 1/2 DEPTH OF PIPE ON BOTH SIDES TO PREVENT SCOUR AROUND THE PIPE.

RIPRAP APRON AT PIPE OUTLET

SCALE: NOT TO SCALE



SECTION A-A

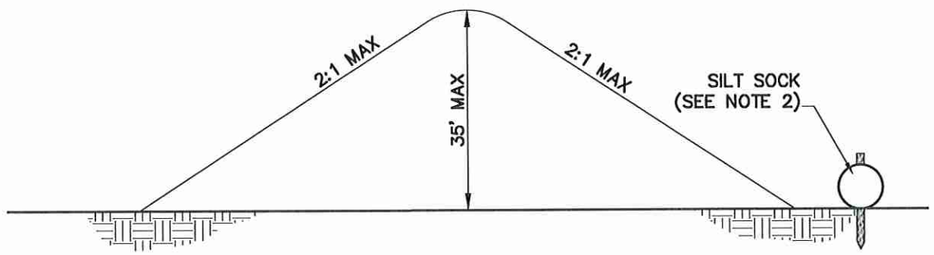


PLAN VIEW

NOTES:
1. INSTALL ON FLAT GRADE FOR OPTIMUM PERFORMANCE.
2. 18" DIAMETER FILTER SOCK MAY BE STACKED ONTO DOUBLE 24" DIAMETER SOCKS IN PYRAMIDAL CONFIGURATION FOR ADDED HEIGHT.
3. A SUITABLE IMPERVIOUS GEOMEMBRANE SHALL BE PLACED AT THE LOCATION OF THE WASHOUT PRIOR TO INSTALLING THE SOCKS
4. ANY CONCRETE MATERIALS IN THE COMPOST FILTER SOCK CONCRETE WASHOUT SHOULD BE DISPOSED OF PROPERLY OFF-SITE.

COMPOST SOCK CONCRETE WASHOUT

SCALE: NOT TO SCALE



NOTES:
1. STOCKPILE HEIGHTS MUST NOT EXCEED 35 FEET. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.
2. SILT SOCK SHALL BE INSTALLED AT THE DOWNSLOPE SIDE OF THE MATERIAL STOCKPILE.
3. MATERIAL STOCKPILES SHALL BE TEMPORARILY STABILIZED WITH SEED AND MULCH.
4. MATERIAL STOCKPILE LOCATIONS SHALL BE PROVIDED WHERE INDICATED ON THE PLAN, OR ALTERNATE LOCATION APPROVED BY ENGINEER.

TOPSOIL STOCKPILE

SCALE: NOT TO SCALE

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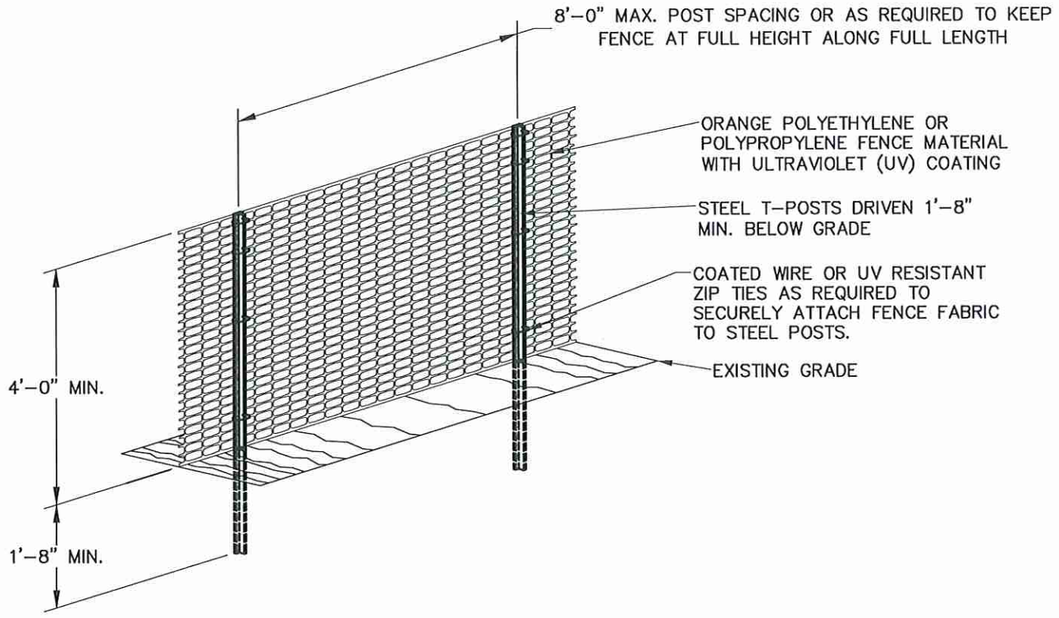
Project No.: 6403-127
Sheet No.: C-502

CONSTRUCTION PLAN SET



PROTECTIVE FENCE NOTES

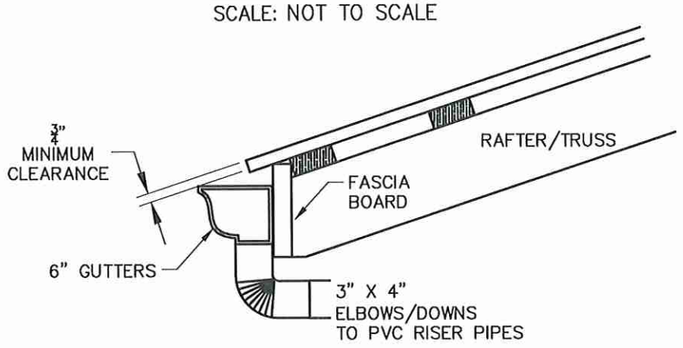
1. CONTACT PA ONE–CALL BEFORE DRIVING POSTS FOR THE TEMPORARY PROTECTIVE FENCE.
2. ALL SENSITIVE AREAS SHALL BE PROTECTED AS PER PLAN.
3. ALL TREES IN THE CONSTRUCTION AREA NOT SPECIFICALLY DESIGNATED FOR REMOVAL SHALL BE PRESERVED AND PROTECTED WITH HIGH VISIBILITY FENCE AS PER PLAN.
4. WHEN PRACTICABLE, INSTALL HIGH VISIBILITY FENCE THREE FEET OUTSIDE OF THE DRIP LINE OF THE TREES BUT NO CLOSER THAN THE ACTUAL DRIP LINE.
5. SAFETY FENCE SHOULD BE FASTENED SECURELY TO THE STEEL T–POSTS.
6. IMMEDIATELY REPAIR ANY PROTECTIVE FENCE THAT GETS KNOCKED DOWN OR DETACHED FROM THE FENCE POSTS.
7. THE FENCING MUST REMAIN IN PLACE DURING ALL PHASES OF CONSTRUCTION. ANY CHANGES TO THE PROTECTIVE FENCING LAYOUT MUST BE APPROVED BY THE ENGINEER.

TEMPORARY PROTECTIVE FENCE ON T-POSTS

SCALE: NOT TO SCALE

GUTTER HANGING DETAIL

SCALE: NOT TO SCALE

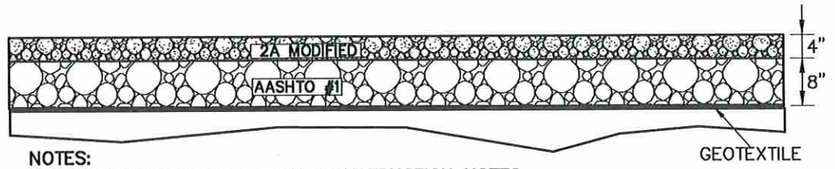


GUTTER DETAIL INFORMATION

- 6" BOX OGEE ALUMINUM GUTTERS
- 1/32" FALL PER FOOT
- 3" X 4" RECTANGULAR DOWNS AT END OF EVERY SECTION
- ALL DOWNS DISCHARGE INTO 4" SCHD. 40 RISER PIPE
- GUTTERS SECURED TO FASCIA BOARD @ 24" MAX. SPACING
- START GUTTER SECTION SLOPE W/MIN. PITCH CLEARANCE FROM METAL ROOFING PLANE

ACCESS ROAD DETAIL

SCALE: NOT TO SCALE



NOTES:

1. GEOTEXTILE *SEE GENERAL CONSTRUCTION NOTES.
2. STONE DEPTH SHALL BE MEASURED AFTER COMPACTION.
3. ALL STONE SHALL BE COMPACTED WITH A SMOOTH DRUM, VIBRATORY ROLLER.
4. SURFACING MATERIAL WILL BE 2A MODIFIED.

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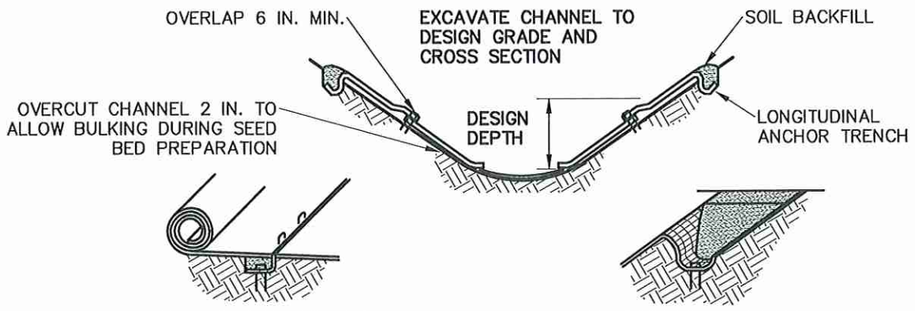
Sheet No.: C-503

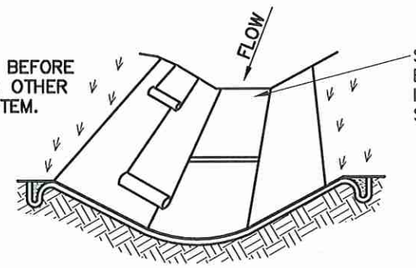
CONSTRUCTION PLAN SET



INTERMITTENT CHECK SLOT

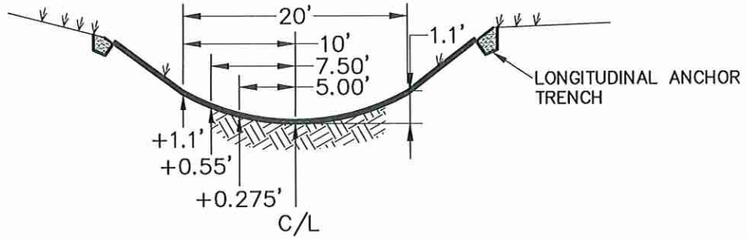
LONGITUDINAL ANCHOR TRENCH

PREPARE SOIL AND APPLY SEED BEFORE INSTALLING BLANKETS, MATS, OR OTHER TEMPORARY CHANNEL LINER SYSTEM.



SHINGLE–LAP SPLICED ENDS OR BEGIN NEW ROLL IN AN INTERMITTENT CHECK SLOT. MIN. SHINGLE LAP = 6 IN.

ISOMETRIC VIEW



(LOOKING DOWNSTREAM)

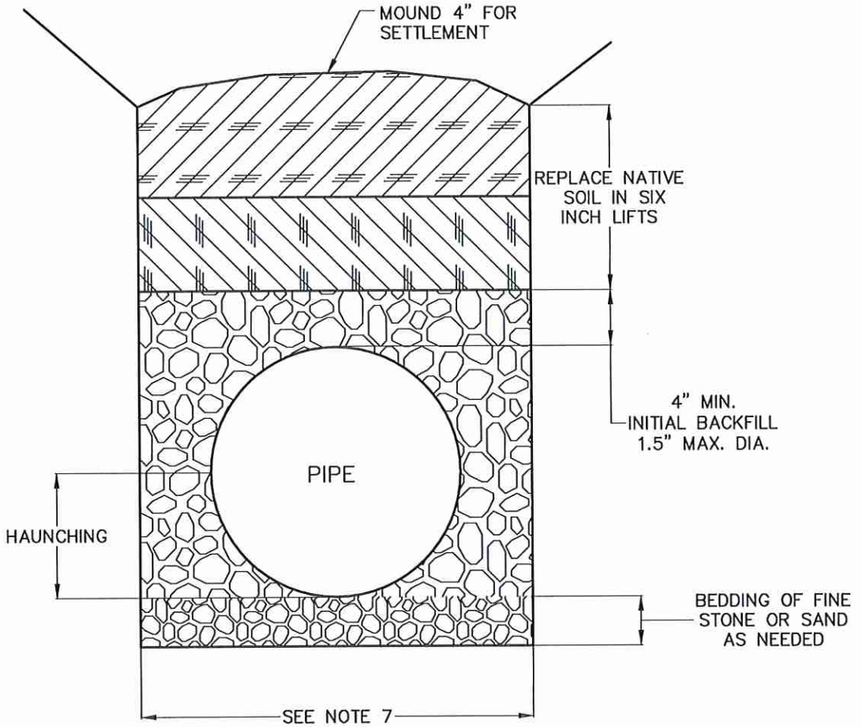
CHANNEL CROSS-SECTION

* S75BN MATTING, SEE MANUFACTURER'S LINING INSTALLATION DETAIL FOR STAPLE PATTERNS, VEGETATIVE STABILIZATION FOR SOIL AMENDMENTS, SEED MIXTURES AND MULCHING INFORMATION

NOTES:
1. ANCHOR TRENCHES SHALL BE INSTALLED AT BEGINNING AND END OF CHANNEL IN THE SAME MANNER AS LONGITUDINAL ANCHOR TRENCHES.
2. CHANNEL DIMENSIONS SHALL BE CONSTANTLY MAINTAINED. CHANNEL SHALL BE CLEANED WHENEVER TOTAL CHANNEL DEPTH IS REDUCED BY 25% AT ANY LOCATION.
3. SEDIMENT DEPOSITS SHALL BE REMOVED WITHIN 24 HOURS OF DISCOVERY OR AS SOON AS SOIL CONDITIONS PERMIT ACCESS TO CHANNEL WITHOUT FURTHER DAMAGE. DAMAGED LINING SHALL BE REPAIRED OR REPLACED WITHIN 48 HOURS OF DISCOVERY.
4. NO MORE THAN ONE THIRD OF THE SHOOT (GRASS LEAF) SHALL BE REMOVED IN ANY MOWING. GRASS HEIGHT SHALL BE MAINTAINED BETWEEN 2 AND 3 INCHES UNLESS OTHERWISE SPECIFIED. EXCESS VEGETATION SHALL BE REMOVED FROM PERMANENT CHANNELS TO ENSURE SUFFICIENT CHANNEL CAPACITY.

VEGETATED CHANNEL

SCALE: NOT TO SCALE



NOTES:
1. TRENCHING SHALL BE IN ACCORDANCE WITH OSHA RECOMMENDATIONS
2. MATERIAL USED FOR INITIAL BACKFILL AND HAUNCHING SHALL BE CRUSHED STONE WITH A MAXIMUM SIZE OF 1.5 INCHES.
3. WHEN USING CRUSHED STONE FOR INITIAL BACKFILL AND HAUNCHING, PLACE AND WORK BY HAND TO INSURE ALL EXCAVATED AREAS ARE FILLED.
4. COMPACT NATIVE SOIL BACKFILL WITH VIBRATORY COMPACTOR IF IN VEHICULAR TRAFFIC AREAS.
5. MACHINE DIRECTED MECHANICAL COMPACTION MAY BE USED ONLY AFTER SUFFICIENTLY HAND COMPACTING A MINIMUM OF 2 FT. OVER THE PIPE.
6. ALL COMPACTION SHALL BE IN 6 INCH LAYERS AND SHALL BE TAKEN TO THE TRENCH WALLS.
7. AS PER ASTM D 2321, TRENCH WIDTH SHALL BE THE GREATER OF:
   - 7.1. PIPE DIAMETER PLUS 15 INCHES.
   - 7.2. (PIPE DIAMETER X 1.25) PLUS 12 INCHES.

TRENCH DETAIL

SCALE: NOT TO SCALE

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Date: 03-23-2026
Project No.: 6403-127
Sheet No.: C-504

CONSTRUCTION PLAN SET

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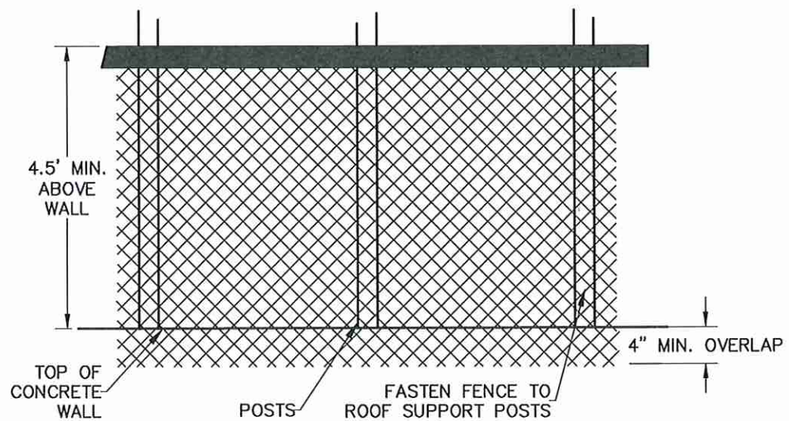
SAFETY FENCE OPTIONS

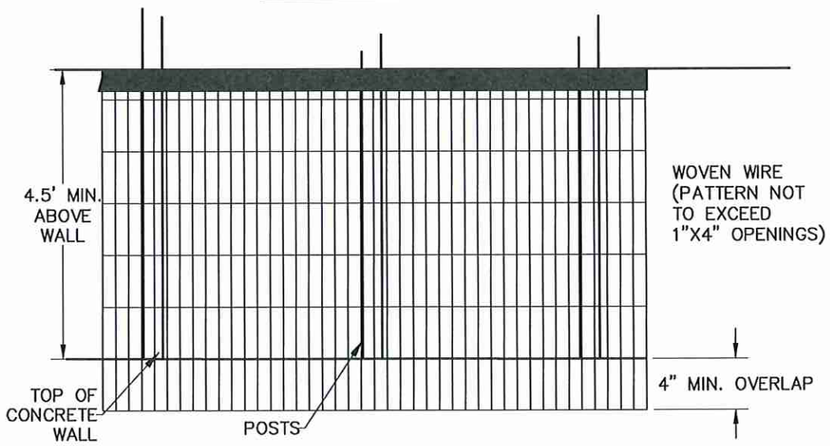
SCALE: NOT TO SCALE

*ALONG TOP OF HEAVY USE AREA OR STACKING STRUCTURE WALLS WITH DROPS EXCEEDING 3.5'
THESE DETAILS DO NOT APPLY FOR LIQUID STORAGES

SAFETY FENCE OPTION #1
CHAIN–LINK FENCE



SAFETY FENCE OPTION #2
WOVEN WIRE FENCE



CONSTRUCTION NOTES

1. THE FENCE IS ONLY INTENDED TO EXCLUDE HUMANS FROM FALLING OFF OF THE WALL.
2. ATTACH FABRIC TO OUTSIDE FACE OF ROOF SUPPORT POSTS AND CONCRETE WALLS.
3. A TOP AND BOTTOM RAIL MAY BE REQUIRED TO TIGHTEN FENCE ADEQUATELY. PRESSURE TREATED 2X4 TO STRENGTHEN TOP OF MESH. 2x4 ALONG BOTTOM MAY ALSO BE NECESSARY.
4. FENCE SHALL BE FASTENED TO RAILS EVERY 24" (MAXIMUM SPACING).
5. FOR ALL OPTIONS; THE FENCE MUST BE TIGHT ENOUGH SO THAT IT CAN NOT BE PULLED AWAY FROM THE SUPPORTS MORE THAN 4".
6. ALL FASTENERS, CLAMPS, ETC. SHALL BE GALVANIZED OR STAINLESS STEEL.
7. IF ELECTRIC IS USED, WARNING SIGNS FOR ELECTRIC FENCE SHALL BE INSTALLED IN SEVERAL LOCATIONS ON THE STRUCTURE.

OPTION #1:

1. TOP "STIFFENER" BOARD CAN BE REPLACED WITH A GALVANIZED RAIL. IF THE GALVANIZED RAIL IS CHOSEN, IT SHALL BE $1\frac{5}{8}$" MIN. DIAMETER AND 16 GAUGE MIN.
2. TOP/BOTTOM RAIL TO BE GALVANIZED WITH ZINC COATING INSIDE AND OUT, SCH–40 COMBINED COATING 1.8oz./SF MEETING ASTM A123 OR MT–40, 90% ZINC INTERIOR. 1 oz. ZINC EXTERIOR PLUS CHROMATE AND CLEAR ACRYLIC OR MIN. 50,000 PSI.
3. CHAIN–LINK FABRIC SHALL BE 9 GAUGE GALVANIZED STEEL WITH ZINC COATING (ASTM A392 CLASS II) (2oz. per SF), 2" WIRE MESH WITH A MIN. TENSILE STRENGTH OF 1290 LBS.
4. REPAIR GALVANIZED COATING WITH MATERIALS MEETING ASTM A–780

OPTION #2:

1. THE MINIMUM FENCE HEIGHT SHALL BE 4.5' ABOVE TOP OF CONCRETE WALL. BARBED WIRE OR HIGH TENSILE WIRE CAN BE USED ABOVE THE WOVEN WIRE FABRIC AS LONG AS THE SPACING DOES NOT EXCEED 4" BETWEEN ADDITIONAL WIRES AND 4" FROM TOP OF WOVEN WIRE FABRIC TO FIRST ADDITIONAL WIRE.
2. OTHER OPTIONS SHALL BE DISCUSSED WITH THE DESIGN ENGINEER.
3. WOVEN WIRE TO BE 12.5 GAUGE MIN, AND GALVANIZED. WELDED WIRE IS NOT ALLOWED.
4. REPAIR GALVANIZED COATING WITH MATERIALS MEETING ASTM A–780
5. HIGH TENSILE OR BARBED WIRE SHALL BE 12.5 GAUGE MIN., 180,000 PSI FOR ELECTRIFIED WIRE (MIN.). AND 200,000 PSI FOR NON–ELECTRIFIED WIRE.
6. FENCE MUST BE GROUNDED ACCORDINGLY.

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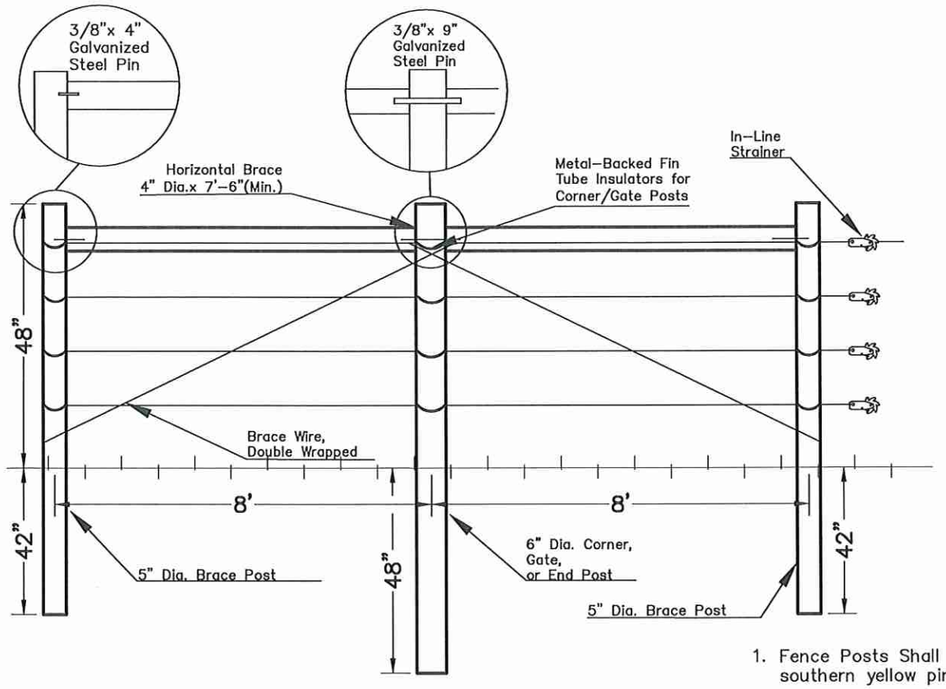
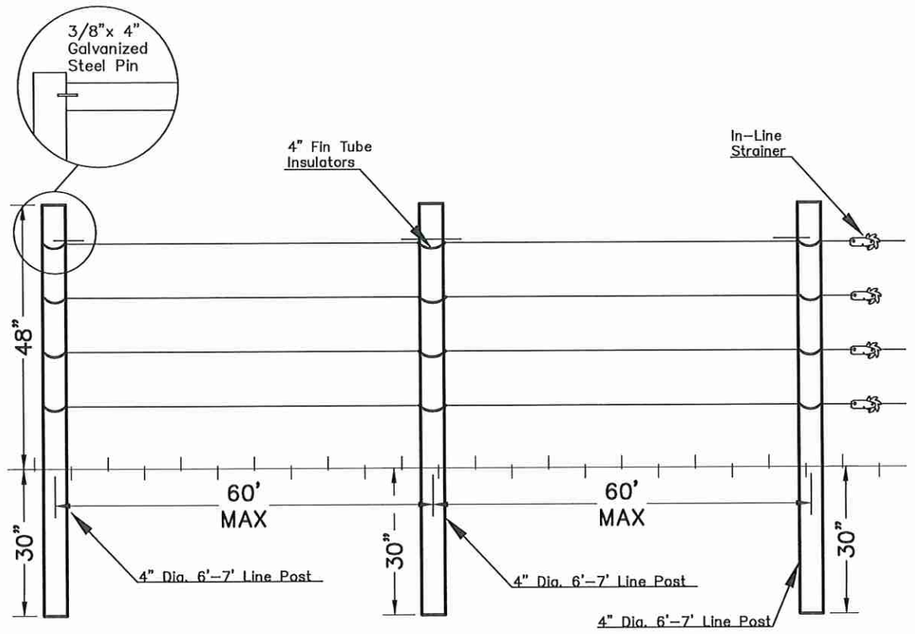
Project No.: 6403-127
Sheet No.: C-505

CONSTRUCTION PLAN SET

CORNER POST FENCE DETAIL



LINE POST FENCE DETAIL



1. Fence Posts Shall be pressure treated southern yellow pine, locust, or cedar

		DIMENSIONS	INSTALLATION
POSTS	CORNER OR GATE POSTS	6" – 7" DIA. x 8' MIN. LENGTH	SET 4' DEEP
	LINE POSTS	4" DIA. x 6 1/2' MIN. LENGTH	SET 2 1/2' DEEP, SPACE 50' OR LESS
BRACING	BRACE POSTS	5"–6" DIA. x 7 1/2' – 8' LONG	SET 3 1/2' – 4' DEEP
	HORIZONTAL BRACE	4"–5" DIA. x 7 1/2' – 8' LONG	PLACE NEAR POST TOPS
	BRACE POST PINS	3/8" x 9" & 3/8" x 4" GALV. STEEL PINS	
	BRACE WIRE	12 1/2 GAUGE HIGH–TENSILE WIRE, CLASS 3 GALVANIZED	HORIZONTAL BRACE DOUBLE–WRAP, TIGHTEN WITH 1 1/2" x 2" x 2' HARDWOOD TWIST ROD
WIRE	TYPE:	12 1/2 GAUGE HIGH–TENSILE, CLASS 3, GALVANIZED, MINIMUM 200,000 PSI BREAKING STRENGTH	
	SPACING:	4 STRAND: FROM GROUND WIRE TO BOTTOM WIRE 10" / FROM GROUND WIRE TO SECOND WIRE 22" / FROM GROUND WIRE TO THIRD WIRE 34" / FROM GROUND WIRE TO FOURTH WIRE 46"	
	TENSION:	250 – 300 POUNDS EACH WIRE. TENSION WITH IN–LINE STRAINERS. INSTALL A TENSION INDICATOR SPRING ON AT LEAST ONE WIRE TO GAUGE WIRE TENSION.	
	FASTENING:	AT GATE, CORNER, AND END BRACES, USE APPROPRIATE KNOTS OR CRIMPING SLEEVES OR WIRE ANCHOR THROUGH POSTS. STAPLE WIRES TO POSTS WITH 1 3/4" 9 GAUGE GALVANIZED STAPLES WITH SLASH CUT POINTS. DO NOT DRIVE STAPLES TIGHT IN LINE POSTS. ANGLE STAPLES TO PREVENT POST SPLITS. DRIVE INTO POST AT DOWNWARD ANGLE ON KNOLLS AND AT AN UPWARD ANGLE IN DEPRESSIONS.	

4- STRAND HIGH TENSILE ELECTRIC FENCE DETAIL

SCALE: NOT TO SCALE

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Sheet No.: C-506

CONSTRUCTION PLAN SET

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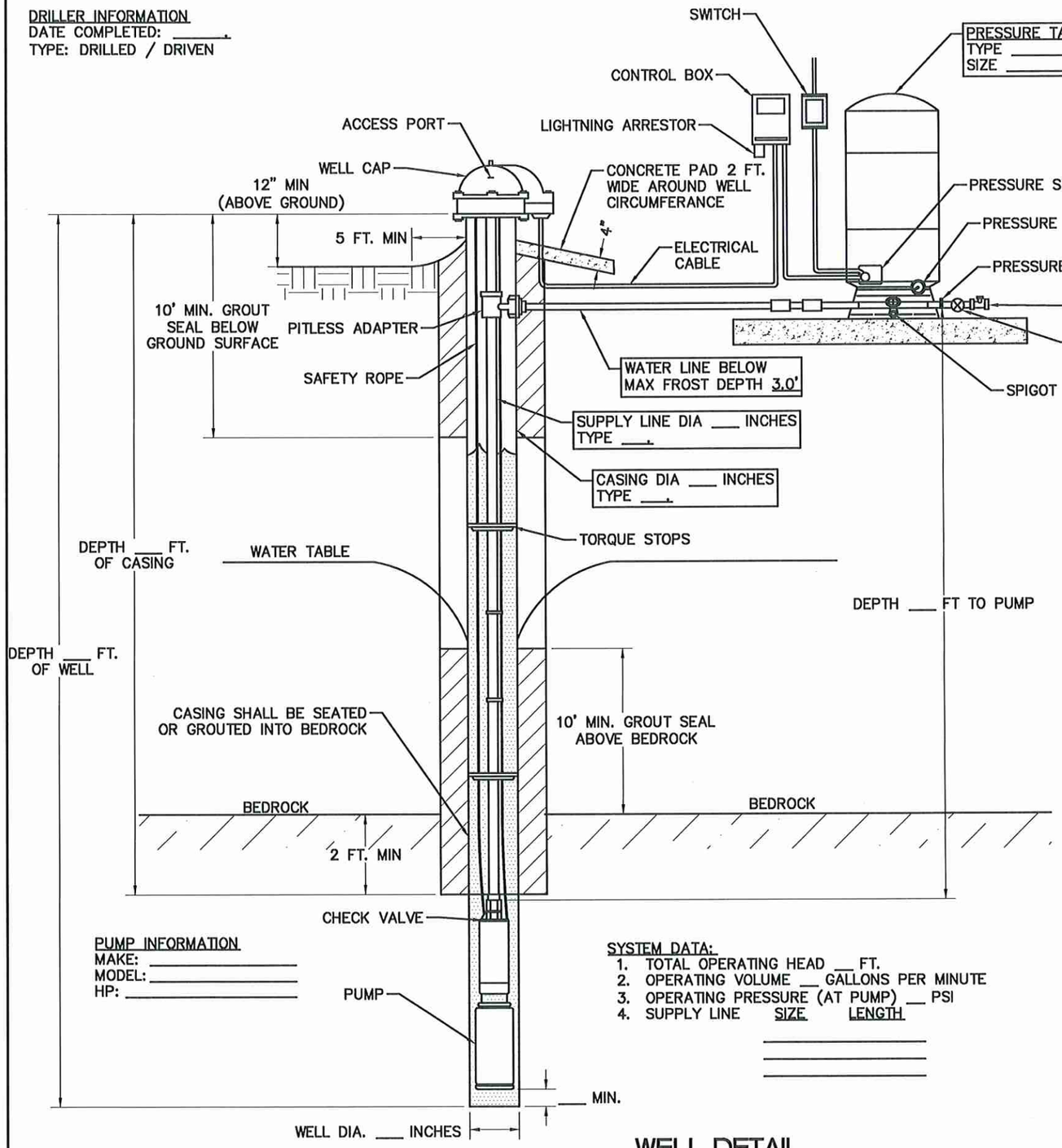
DRILLER INFORMATION
DATE COMPLETED: ____.
TYPE: DRILLED / DRIVEN

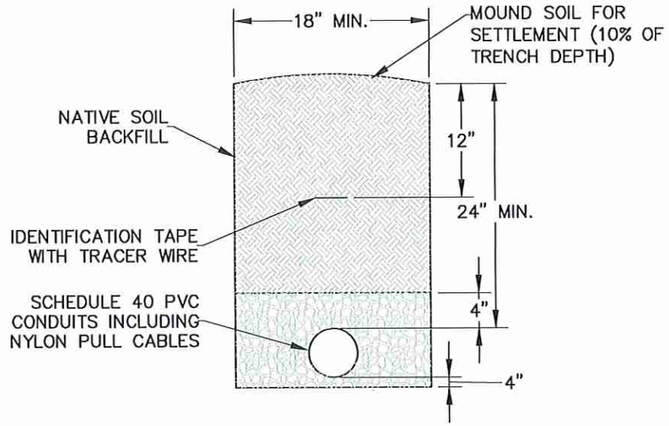


PUMP INFORMATION
MAKE: _____
MODEL: _____
HP: _____

SYSTEM DATA:
1. TOTAL OPERATING HEAD ___ FT.
2. OPERATING VOLUME ___ GALLONS PER MINUTE
3. OPERATING PRESSURE (AT PUMP) ___ PSI
4. SUPPLY LINE SIZE LENGTH

WELL DETAIL
SCALE: NOT TO SCALE

CONSTRUCTION NOTES:
1. SYSTEM SHOWN IS A REPRESENTATION. MODIFICATIONS OR ADDITIONS SHOULD BE MADE AS APPROVED BY ENGINEER OF RECORD.
2. ANTI-SIPHON VALVE IS REQUIRED FOR ALL SYSTEMS. ANTI-SIPHON VALVE SHALL BE WATTS 9-D OR EQUIVALENT.
3. GROUT SEAL REQUIRED FOR ALL SYSTEMS
4. A CONCRETE COLLAR IS REQUIRED.
5. GROUT SEAL LENGTH SHALL AT A MINIMUM EXTEND 10 FT. ABOVE THE BEDROCK IN ADDITION TO 10 FT. BELOW THE GROUND SURFACE. THE AREA IN BETWEEN MAY BE FILLED WITH FINES OBTAINED FROM THE DRILLING PROCESS BUT IT IS RECOMMENDED TO GROUT ALONG THE ENTIRE LENGTH OF CASING.
6. THE PRESSURE TANK AND CONTROL BOX SHALL BE INSTALLED INSIDE AN INSULATED SHED KEPT ABOVE FREEZING.
7. THE SOLAR PUMP, PRESSURE TANK, AND PIPELINE ARE NOT INCLUDED IN THIS WELL DESIGN.



ELECTRIC TRENCH DETAIL
SCALE: NOT TO SCALE

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WELL DETAILS

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ENGINEER
PE098495

Date: 03-23-2026
Project No.: 6403-127
Sheet No.: C-507

CONSTRUCTION PLAN SET

BUILDING CODES AND STANDARDS

A. PENNSYLVANIA UNIFORM CONSTRUCTION CODE (PAUCC)
B. INTERNATIONAL BUILDING CODE (IBC), 2021 EDITION AS ADOPTED AND MODIFIED BY PAUCC
C. AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE) – MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES (ASCE 7–16)

DESIGN CRITERIA AND LOADS

A. OCCUPANCY	
1. RISK CATEGORY	II
B. DEAD LOADS	
1. TRUSS TOP CHORD	5 PSF
2. TRUSS BOT CHORD	5 PSF
C. LIVE LOADS	
1. ROOF	20 PSF
D. SNOW LOADS	
1. GROUND SNOW LOAD (P_g)	40 PSF
2. SNOW LOAD IMPORTANCE FACTOR (I_s)	1.0
3. TEMPERATURE FACTOR (C_t)	1.2
4. EXPOSURE FACTOR (C_e)	1.0
5. FLAT ROOF SNOW LOAD (P_f)	33.6 PSF
6. UNBALANCED WINDWARD SNOW LOAD	10.1 PSF
7. UNBALANCED LEEWARD SNOW LOAD 40 FT WIDE BUILDINGS	51.4 PSF 7.41 FT FROM RIDGE, THEN 33.6 PSF OTHERWISE
E. WIND LOADS	
1. BASIC WIND SPEED (V ULT)	110 MPH
2. BASIC WIND SPEED (V ASD)	85.2 MPH
3. WIND EXPOSURE	C
4. INTERNAL PRESSURE COEFFICIENT	±0.55

5. MINIMUM AND MAXIMUM COMPONENT AND CLADDING DESIGN WIND PRESSURES BASED ON SQUARE AREA:

a. FOR CONNECTION TO ROOF:
- 10 SQUARE FEET (–109.2 PSF; +25.2 PSF)
- 50 SQUARE FEET (–70.2 PSF; +21.4 PSF)
- 100 SQUARE FEET (–53.4 PSF; +19.7 PSF)

b. FOR CONNECTION TO WALL:
- 10 SQUARE FEET (–45.3 PSF; +36.0 PSF)
- 50 SQUARE FEET (–39.6 PSF; +33.1 PSF)
- 100 SQUARE FEET (–31.4 PSF; +29.0 PSF)

GENERAL REQUIREMENTS

A. VERIFY EXISTING CONDITIONS AND DIMENSIONS PRIOR TO BEGINNING WORK OR FABRICATING MATERIALS. NOTIFY STRUCTURAL ENGINEER OF RECORD (SEOR) OF ANY DISCREPANCIES BEFORE PROCEEDING WITH ANY PHASE OF WORK.

B. DO NOT SCALE DRAWINGS FOR THE PURPOSE OF ESTABLISHING DIMENSIONS.

C. STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND ALL OTHER DRAWINGS. VERIFY WITH OTHER TRADES THE REQUIREMENTS FOR CHASES, INSERTS, OPENINGS, SLEEVES, FINISHES, DEPRESSIONS, PADS, AND WALL OPENINGS. REPORT ANY DISCREPANCY TO THE SEOR PRIOR TO FABRICATING OR INSTALLING STRUCTURAL MEMBERS. DEVIATIONS FROM THE OPENINGS SHOWN ON THE STRUCTURAL DRAWINGS MUST BE APPROVED BY THE SEOR PRIOR TO IMPLEMENTING THE CHANGES.

D. DETAILS LABELED "TYPICAL" ON DRAWINGS APPLY TO SITUATIONS OCCURRING ON THE PROJECT THAT ARE THE SAME OR SIMILAR TO THOSE SPECIFICALLY DETAILED. SUCH DETAILS APPLY WHETHER OR NOT DETAILS ARE REFERENCED AT EACH LOCATION. NOTIFY SEOR OF CONFLICT REGARDING APPLICABILITY.

E. OBTAIN SEOR APPROVAL PRIOR TO LOADING SLAB ON GROUND OR SUPPORTED SLABS WITH CRANES, LIFTS, OR ANY OTHER ERECTION EQUIPMENT. UNLESS NOTED OTHERWISE, SLABS HAVE NOT BEEN DESIGNED FOR CONSTRUCTION LOADING.

F. DO NOT STORE OR STACK CONSTRUCTION MATERIALS ON POURED OR ERECTED FLOORS/ROOFS IN EXCESS OF 80 PERCENT OF LIVE LOAD. GENERAL CONTRACTOR SHALL ENSURE THAT ALL SUB– CONTRACTORS ARE INFORMED OF LOADING RESTRICTIONS. AVOID IMPACT WHEN PLACING MATERIALS ON POURED OR ERECTED FLOORS OR ROOF.

G. BEFORE PROCEEDING WITH ANY WORK WITHIN THE PROJECT AREA, THE CONTRACTOR SHALL FAMILIARIZE THEMSELVES WITH EXISTING STRUCTURE AND OTHER CONDITIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ALL NECESSARY BRACINGS, SHORING AND OTHER SAFEGUARDS TO MAINTAIN ALL PARTS OF EXISTING STRUCTURES AND FACILITIES IN A SAFE CONDITION DURING THE PROCESS OF DEMOLITION AND CONSTRUCTION AND TO PROTECT FROM DAMAGE THOSE PORTIONS OF EXISTING STRUCTURES AND FACILITIES WHICH ARE TO REMAIN.

H. THE CONTRACT STRUCTURAL DOCUMENTS REPRESENT THE FINISHED STRUCTURE. THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION. PROVIDE ALL MEASURES REQUIRED TO PROTECT THE STRUCTURE, WORKMEN, AND OTHER PERSONS DURING CONSTRUCTION; INCLUDING BRACING, SHORING FOR CONSTRUCTION EQUIPMENT, SHORING FOR THE BUILDING, FORMS AND SCAFFOLDING, SHORING OF RETAINING WALLS AND OTHER TEMPORARY SUPPORTS AS REQUIRED. COMPLY WITH APPLICABLE REQUIREMENTS OF OSHA AND OTHER GOVERNING BODIES HAVING JURISDICTION AT THE SITE.

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MOLLYE MIKULA HOLBROOK
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PE094304
02/19/2026

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DESIGN CRITERIA AND LOADS

Date: 02-19-2026
Project No.: 6403-127
Sheet No.: S-001

FINAL SUBMISSION

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WOOD FRAMING

A. STANDARDS

1. AMERICAN FOREST & PAPER ASSOCIATION NATIONAL DESIGN SPECIFICATION (NDS) FOR WOOD CONSTRUCTION WITH SUPPLEMENT

B. MATERIALS

1. ALL WOOD FRAMING SHALL BE SURFACED DRY AND USED AT 19% MAXIMUM MOISTURE CONTENT. VISUALLY GRADED DIMENSION LUMBER SHALL BE ONE OF THE FOLLOWING:

   a. MICROLAM BEAM (LVL), WITH STRESS PROPERTIES:
   - Fb 2,600 PSI
   - Fv 285 PSI
   - Ft 1550 PSI
   - Fc 2,510 PSI
   - E 2,000,000 PSI

   b. SPRUCE PINE FIR (SPF), NO. 2 WITH STRESS PROPERTIES:
   - Fb 875 PSI
   - Fv 135 PSI
   - Ft 450 PSI
   - Fc 1,150 PSI
   - E 1,400,000 PSI

   c. GLULAM BEAMS/COLUMNS (GL), WITH STRESS PROPERTIES:
   - Fb 2,400 PSI
   - Fv 300 PSI
   - Ft 1,100 PSI
   - Fc 1,500 PSI
   - E 1,700,000 PSI

2. SOLID SAWN LUMBER SHALL COMPLY WITH THE LATEST EDITION OF THE GRADING RULES OF THE WESTERN WOOD PRODUCTS ASSOCIATION (WWPA). ALL SOLID SAWN LUMBER SHALL BE STAMPED WITH THE GRADE MARK OF AN APPROVED GRADING AGENCY.

3. PREFABRICATED METAL JOIST HANGERS, STRAPS, TIES, CLIPS, HOLD-DOWN ANCHORS AND OTHER ACCESSORIES SHALL BE AS MANUFACTURED BY "SIMPSON STRONG TIE COMPANY" OR APPROVED EQUAL. INSTALL ALL ACCESSORIES PER THE MANUFACTURER'S REQUIREMENTS. ALL STEEL SHALL HAVE A MINIMUM THICKNESS OF 0.04 INCHES (PER ASTM A446, GRADE A) AND BE GALVANIZED (COATING G60).

4. ALL BOLTS SHALL BE ASTM A307, UNLESS NOTED OTHERWISE.

C. EXECUTION

1. ALL FRAMING EXPOSED TO THE WEATHER, IN CONTACT WITH MASONRY OR CONCRETE, OR DENOTED "PT" SHALL BE PRESSURE-TREATED ACCORDING TO THE AWPA C2. ALL CUTS AND HOLES SHALL BE BRUSHED WITH (2) COATS OF COPPER NAPHTHENATE SOLUTION (AWPA M4).

2. BOLT HOLES SHALL BE CAREFULLY CENTERED AND DRILLED NOT MORE THAN 1/16" LARGER AND NOT LESS THEN 1/32" SMALLER THAN THE BOLTS DIAMETER. BOLTED CONNECTIONS SHALL BE SNUGGED TIGHT BUT NOT TO THE EXTENT OF CRUSHING WOOD UNDER WASHERS.

3. FASTEN MEMBERS IN ACCORDANCE W/ CHAPTER 23 OF THE IBC.

4. PROVIDE CONTINUOUS 2x STUD WIDTH BLOCKING BETWEEN STUDS AT MID-HEIGHT SUCH THAT UN-BRACED LENGTH OF STUDS DOES NOT EXCEED 10'-0" (10 FEET).

5. PROVIDE 2x SOLID BLOCKING BETWEEN JOISTS OR RAFTERS OVER SUPPORTS.

6. ALL NUTS SHALL BE TIGHTENED WHEN PLACED AND RE-TIGHTENED PRIOR TO CLOSING IN WALLS.

7. ALL NAILS SHALL BE COMMON WIRE NAILS, UNLESS NOTED OTHERWISE.

8. NAIL HOLES SHALL BE SUB-DRILLED WHERE NECESSARY TO PREVENT SPLITTING WOOD.

9. DO NOT NOTCH JOISTS, RAFTERS OR BEAMS, EXCEPT WHERE SHOWN IN DETAILS. OBTAIN SEOR APPROVAL FOR ANY HOLES OR NOTCHES NOT DETAILED.

WOOD TRUSSES

A. STANDARDS

1. TRUSS PLATE INSTITUTE (TPI) NATIONAL DESIGN STANDARDS FOR METAL-PLATE-CONNECTED WOOD TRUSS CONSTRUCTION (TPI 1)

B. MATERIALS

1. DIMENSIONAL LUMBER FRAMING MEMBERS CONNECTED WITH HOT-DIPPED GALVANIZED METAL PLATES.

2. WOOD MATERIALS SHALL BE KILN DRIED AND USED AT 19% MAXIMUM MOISTURE CONTENT. PROVIDE GRADE AS REQUIRED TO SATISFY STRESS REQUIREMENTS UNLESS NOTED OTHERWISE.

3. CONNECTOR PLATES SHALL BE NOT LESS THAN 0.036 INCHES (20 GAUGE) IN COATED THICKNESS, SHALL MEET OR EXCEED ASTM GRADE A OR HIGHER AND SHALL BE HOT DIPPED GALVANIZED ACCORDING TO ASTM A-525 (COATING G60). MINIMUM YIELD STRESS SHALL BE 33,000 PSI.

4. WOOD TRUSSES SHALL BE DESIGNED BY THE MANUFACTURER TO RESIST THE DESIGN LOADS LISTED ON THE DRAWINGS, APPLIED AS REQUIRED BY CODE.

C. EXECUTION

1. WOOD TRUSSES SHALL BE DESIGNED BY THE MANUFACTURER IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF THE LATEST EDITION OF THE NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION, THE TRUSS PLATE INSTITUTE AND THE INTERNATIONAL BUILDING CODE.

2. TRUSSES SHALL BE FABRICATED IN A PROPERLY EQUIPPED MANUFACTURING FACILITY OF A PERMANENT NATURE. TRUSSES SHALL BE MANUFACTURED BY EXPERIENCED WORKERS, USING PRECISION CUTTING, JIGGING AND PRESSING EQUIPMENT UNDER THE REQUIREMENTS IN QUALITY CONTROL STANDARDS QST-88 OF THE TRUSS PLATE INSTITUTE.

3. SECONDARY BENDING STRESSES IN TRUSS TOP AND BOTTOM CHORDS DUE TO DEAD, LIVE AND WIND LOADS SHALL BE IN THE DESIGN. LOAD DURATION FACTOR SHALL BE PER THE "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION".

4. EXAMINE SUPPORTING SUBSTRATES AND ABUTTING STRUCTURAL FRAMING FOR COMPLIANCE WITH REQUIREMENTS FOR INSTALLATION TOLERANCES AND OTHER CONDITIONS AFFECTING PERFORMANCE OF THE WORK. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

5. WOOD TRUSSES SHALL BE ERECTED IN ACCORDANCE WITH THE TRUSS MANUFACTURER'S REQUIREMENTS. THIS WORK SHALL BE DONE BY A QUALIFIED AND EXPERIENCED CONTRACTOR.

6. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY AND PERMANENT BRACING AS REQUIRED FOR SAFE ERECTION AND PERFORMANCE OF THE TRUSSES. THE GUIDELINES SET FORTH BY THE TRUSS PLATE INSTITUTE PUBLICATION BCSI 1, "GUIDE TO GOOD PRACTICE FOR HANDLING, INSTALLING AND BRACING OF METAL PLATE CONNECTED WOOD TRUSSES" SHALL BE A MINIMUM REQUIREMENT.

7. TRUSS SHOP DRAWINGS SHALL BE PROVIDED TO THE ENGINEER OF RECORD FOR APPROVAL PRIOR TO BEING FABRICATED.

8. ROOFING MATERIAL SHALL BE STEEL OR ALUMINUM. STEEL SHALL BE: GALVANIZED STEEL, PAINTED GALVANIZED STEEL, OR PAINTED STEEL. TYPE OF ROOFING MATERIAL TO BE DISCUSSED WITH LANDOWNER PRIOR TO BID SOLICITATION. STEEL ROOFING MATERIAL SHALL BE 29 GAUGE MINIMUM. ALUMINUM ROOFING MATERIAL SHALL HAVE A MINIMUM NOMINAL THICKNESS OF 0.018 INCHES. GALVALUME ROOFING IS NOT PERMITTED FOR USE.

9. ROOF FASTENERS SHALL BE A COMBINATION OF ZINC COATED STEEL AND NEOPRENE WASHER. DOUBLE STITCH THE SEEMS OF THE ROOF EDGES. TYPICAL STEEL ROOF SHALL HAVE FASTENERS ON A 9" SPACING ON THE PURLINS AND 24" ON CENTER.

10. END TRUSSES SHALL BE FACED WITH ROOFING MATERIAL, AS SPECIFIED ABOVE. THIS SHALL BE DISCUSSED WITH THE LANDOWNER PRIOR TO BID SOLICITATION.

11. VENTILATION SHALL BE PROVIDED BY AN "OVERHSHOT" TOP CHORD OF THE TRUSS, AS SHOWN ON THE DRAWINGS; A MINIMUM OF 8" OPENING IS REQUIRED FOR THIS STRUCTURE.

12. PERMANENT CONTINUOUS LATERAL BRACING IS REQUIRED, ACCORDING TO THE TRUSS MFR DRAWINGS. CONTINUOUS LATERAL BRACING MUST BE INSTALLED WITH STAGGERED SIDE BY SIDE OVERLAP CONNECTIONS (NO BUTT TO BUTT CONNECTIONS). THE ENDS OF THE BRACES MUST EXTEND FULLY PAST THE TRUSS AND ALLOW A TWO-NAIL CONNECTION WITHOUT USING TOENAILS.

13. PERMANENT DIAGONAL BRACING IS REQUIRED AT EACH END OF THE BUILDING AND AT INTERVALS AS REQUIRED BY TRUSS MANUFACTURER. ALL BRACING SHALL BE INSTALLED AS PER THE TRUSS PLATE INSTITUTE BCSI-B3 AND THE DETAILED DRAWINGS

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WOOD CONSTRUCTION NOTES

Date: 02-19-2026
Project No.: 6403-127
Sheet No.: S-002

FINAL SUBMISSION

TRUSS DESIGN NOTES

1. TRUSSES SHALL BE USED FOR THE ROOF FRAMING. SHOP DRAWINGS SHALL BE PROVIDED TO THE DESIGN ENGINEER FOR APPROVAL PRIOR TO ORDERING THE TRUSSES AND "PE" (PROFESSIONAL ENGINEER) SEALED SHOP DRAWINGS SHALL BE SUPPLIED BY THE TRUSS PLATE INSTITUTE CERTIFIED MANUFACTURER AT THE TIME OF TRUSS DELIVERY. (TRUSS AND STRINGER CONFIGURATION SHOWN SHOWN IN THE DRAWINGS IS FOR ILLUSTRATION PURPOSES ONLY) LARSON DESIGN GROUP AND NRCS DOES NOT DESIGN ROOF TRUSSES THE TRUSS DESIGNER SHALL BE AWARE OF KNEE BRACING BEING USED.
2. ALL NAILS SHALL HAVE FULL HEADS; CLIPPED HEADS ARE NOT ACCEPTABLE.
3. ALL NAILS AND BOLTS USED WITH PRESSURE TREATED WOOD SHALL BE HOT-- DIP GALVANIZED NAILS THAT MEET THE MINIMUM GALVANIZED COATING REQUIREMENTS FOR THE MOST RESTRICTIVE WOOD PRESERVATIVE TREATMENT METHOD. (I.E. CCA TREATED WOOD REQUIRES A MINIMUM COATING RATING OF G--90 HOWEVER ACQ TREATED WOOD REQUIRES A COATING RATING OF G--185. WHEN THE WOOD TYPES ARE MIXED, USE THE G--185 CONNECTORS. CONSULT WITH INDIVIDUAL FASTENER, HARDWARE MANUFACTURER FOR RECOMMENDATIONS)
   CAUTION: NEW WOOD PRESERVATIVE TREATMENT METHODS REQUIRE SPECIAL FASTENERS AND CONNECTORS. ALL PLATES AND FASTENERS USED WITH ACQ, CBA OR CA TREATMENT FORMULAS MUST CONFORM TO ASTM STANDARDS; ASTM A153 FOR HOT-- DIP FASTENERS, AND A653 FOR HOT-- DIP CONNECTOR AND SHEET PRODUCTS. THIS CHANGE INCREASES THE GALVANIZED COATING REQUIREMENTS TO A DESIGNATION OF G--185.STAINLESS STEEL FASTENERS AND CONNECTIONS MAY BE USED IN PLACE OF HOT-- DIP GALVANIZED PRODUCTS.
4. NAILS FOR GENERAL FRAMING CAN BE COMMON, FULL HEAD SIZE 16D OR LARGER, SMOOTH NAILS. GENERAL FRAMING INCLUDES PURLINS, DIAGONAL BRACES, LATERAL BRACES, ETC.
5. BOLTS, SCREWS, OR METAL PLATE CONNECTORS MAY BE USED INSTEAD OF NAILS. SUCH SUBSTITUTIONS SHALL PROVIDE A CONNECTION OF EQUAL OR GREATER STRENGTH AND DURABILITY, ACCORDING TO THE NOTION AT FOREST PRODUCTS ASSOCIATION'S (NFPA) NATION AT DESIGN SPECIFICATION. ALTERNATE CONNECTORS MUST BE APPROVED BY THE DESIGN ENGINEER.
6. ALL WOOD IN CONTACT WITH THE GROUND OR MANURE SHALL BE PRESSURE TREATED AS PER AMERICAN WOOD PRESERVER'S ASSOCIATION STANDARD (POSTS SHALL BE TREATED TO 0.6 #/CU.FT. AND ALL OTHER WOOD SHALL BE TREATED TO 0. 4 #/CU.FT.)
7. ALL STRUCTURAL MEMBERS WHICH INCLUDES: ALL WYE AND KNEE BRACING, BEARING BLOCKS, TRUSS SUPPORT BLOCKS, AND GIRDERS/HEADERS; (EXCLUDING MICROLLAM GIRDERS/HEADERS) SHALL BE SOUTHERN YELLOW PINE OR DOUGLAS FIR--LURCH NO. 2 GRADE
   (SURFACE DRY, USED AT 19% MAXIMUM MOISTURE CONTENT).
   ALL SECONDARY MEMBERS SUCH AS PERMANENT OR CONTINUOUS BRACING SHALL BE (SYP) SOUTHERN PINE NO. 3, (SPF) SPRUCE-- PINE-- FIR NO. 2 OR BETTER.
   PURLINS SHALL BE SYP NO. 2, SPF NO. 2, OR BETTER IF SPACED AT 2' CENTERS.
   PURLINS SHALL BE SYP NO. 3 OR BETTER IF SPACED AT 1.5' CENTERS.
8. POSTS ARE TO BE 4-PLY 2X8 GLU LAMINATED (AS SHOWN IN THE DRAWING) & PRESSURE TREATED, #2 GRADE SYP (SOUTHERN YELLOW PINE). POSTS ARE TO BE FULLY PRESSURE TREATED THE ENTIRE HEIGHT.
9. GALVANIZED ANGLE IRON (1/4" THICK X 3" WIDE BOTH WAYS) CAN BE INSTALLED ON THE CORNERS OF THE POSTS AT ENTRANCE LOCATIONS. OTHER MEANS OF POST PROTECTION MAY BE USED IF APPROVED BY THE DESIGN ENGINEER.
10. KNEE AND WYE BRACING ARE REQUIRED FOR THE POSTS AND GIRDERS AS SHOWN. NO WYE BRACING SHALL BE INSTALLED ON THE "INSIDE" OF THE ENTRANCE LOCATIONS.
11. PERMANENT CONTINUOUS LATERAL BRACING IS REQUIRED, ACCORDING TO THE TRUSS MFG DRAWINGS. CONTINUOUS LATERAL BRACING MUST BE INSTALLED WITH STAGGERED SIDE BY SIDE OVERLAP CONNECTIONS (NO BUTT TO BUTT CONNECTIONS). THE ENDS OF THE BRACES MUST EXTEND FULLY PAST THE TRUSS AND ALLOW A 2-NAIL CONNECTION WITHOUT USING TOENAILS.
12. PERMANENT DIAGONAL BRACING IS REQUIRED AT EACH END OF THE BUILDING AND AT INTERVALS NOT TO EXCEED WHAT IS SHOWN IN THE DRAWINGS. ALL BRACING SHALL BE INSTALLED AS PER THE TRUSS PLATE INSTITUTE BCSI-B3 AND THE DETAILED DRAWING.
13. ROOFING MATERIAL SHALL BE STEEL OR ALUMINUM. STEEL SHALL BE: GALVANIZED STEEL, PAINTED GALVANIZED STEEL, OR PAINTED STEEL. TYPE OF ROOFING TO BE DISCUSSED WITH LANDOWNER PRIOR TO BID SOLICITATION. STEEL ROOFING MATERIAL SHALL BE 29 GAUGE MINIMUM. ALUMINUM ROOFING MATERIAL SHALL HAVE A MINIMUM NOMINAL THICKNESS OF 0.018 INCHES. GALVALUME ROOFING IS NOT PERMITTED FOR USE.
14. ROOF FASTENERS SHALL BE A COMBINATION OF ZINC COATED STEEL AND NEOPRENE WASHER. DOUBLE STITCH THE SEEMS OF THE ROOF EDGES. TYPICAL STEEL ROOF SHALL FASTENERS ON A 9" SPACING ON THE PURLINS 24" ON CENTER.
15. END TRUSSES SHALL BE FACED WITH ROOFING MATERIAL, AS SPECIFIED ABOVE. THIS SHALL BE DISCUSSED WITH THE LANDOWNER PRIOR TO BID SOLICITATION.
16. VENTILATION SHALL BE PROVIDED BY AN "OVERSHOT" TOP CHORD OF THE TRUSS, AS SHOWN ON THE DRAWINGS; A MINIMUM OF 8" OPENING IS REQUIRED FOR THIS STRUCTURE.
17. BIRD NETTING IS OPTIONAL ON THE BOTTOM CHORD OF THE TRUSS.
18. GIRDER REQUIREMENTS:
    1.75" x 9.25" LVL'S: MOMENT RATING=5,406 FT-LBS, FB=2,600 PSI, FV=285 PSI, $E=2.0x10^6$

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TRUSS CONSTRUCTION NOTES

Date: 02-19-2026
Project No.: 6403-127
Sheet No.: **S-003**

FINAL SUBMISSION

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CONCRETE CONSTRUCTION NOTES

REINFORCEMENT

1. REINFORCING STEEL IS TO BE GRADE 60. WHERE 6"X6" W2.9XW2.9 (6 GAGE) IS SPECIFIED; THE FABRIC SHALL BE MATS, NOT ROLLS, SUPPORTED ON STEEL CHAIRS. NO CINDER OR CONCRETE BRICKS ARE PERMITTED. SUPPORT SHALL BE OFTEN ENOUGH SO REINFORCEMENT STAYS AT THE REQUIRED LOCATION WITHIN THE SLAB OR FOOTING. A 5' (MAX) CHAIR SPACING IS REQUIRED.
2. FORM OIL SHALL NOT BE SPRAYED ON ANY REBAR, WATERSTOPS, OR CONCRETE.

CONCRETE

1. 4,500 PSI 28–DAY COMPRESSIVE STRENGTH
2. MAXIMUM WATER–CEMENT RATIO 0.45
3. EXPOSURE CATEGORIES: F2, S0, W0, C0
4. AIR–CONTENT 5 TO 7%, WITH AIR–ENTRAINMENT
5. MAX CONCRETE TEMPERATURE IS 90°
6. SLUMP SHALL BE 2 TO 4 INCHES PRIOR TO ADDITION OF SUPERPLASTICIZING ADMIXTURES BEING ADDED, 3 TO 6 INCHES WITHOUT USE OF SUPERPLASTICIZERS.
7. SLUMP CAN BE 7.5 INCHES MAX WITH THE ADDITION OF SUPERPLASTICIZING ADMIXTURES.
8. CONCRETE ADMIXTURES SHALL MEET ASTM–C260 FOR AIR ENTRAINMENT, AND ASTM C494 TYPE A, D, F OR G FOR WATER–REDUCTION AND SET–RETARDATION AND TYPES C OR E FOR NON–CORROSIVE ACCELERATORS.
9. ADMIXTURES SHALL BE INCLUDED IN THE DESIGN MIX. FOLLOW DOSAGES AND RECOMMENDATIONS OF MANUFACTURER.
10. THE CONTRACTOR(S) SHALL PROVIDE A DESIGN MIX TO THE CERTIFYING AGENCY OR ENGINEER FOR APPROVAL PRIOR TO ORDERING CONCRETE. ALL LOAD TICKETS SHALL BE PROVIDED TO AND APPROVED BY THE INSPECTOR ON SITE AND SHALL REFLECT ALL MATERIALS AND QUANTITIES INCLUDING ADMIXTURES, AMOUNT OF WATER (METERED WATER AND FREE MOISTURE IN THE AGGREGATE), AND TOTAL SIZE OF THE BATCH. THE BATCH TICKET MUST INDICATE THE AMOUNT OF WATER THAT MAY BE ADDED ON–SITE WHILE MAINTAINING THE DESIGN REQUIREMENTS OR NO WATER MAY BE ADDED.
11. CEMENTITIOUS MATERIAL MAY CONTAIN UP TO 20% SLAG IN THE MIX.
12. THE CONCRETE MIX MAY CONTAIN TYPE 1L PORTLAND–LIMESTONE CEMENT: NOT TO EXCEED 10% LIMESTONE CONTENT.
13. REFER TO ACI 305R FOR HOT WEATHER CONCRETING AND ACI 306R FOR COLD WEATHER CONCRETING

PLACEMENT

1. CONCRETE SHALL ONLY BE PLACED IN THE PRESENCE OF THE ASSIGNED SITE INSPECTOR.
2. PLACEMENT DURING HOT OR COLD WEATHER WILL REQUIRE A WRITTEN PLAN IN ADVANCE DETAILING CONCRETE CONDITIONS, PLACEMENT PROVISIONS, AND A CURING PLAN.
3. CONCRETE SHALL NOT BE PLACED UNTIL THE SUBGRADE, FORMS, AND STEEL REINFORCEMENTS HAVE BEEN INSPECTED AND APPROVED BY THE SITE INSPECTOR. NOTIFICATION SHALL BE GIVEN FAR ENOUGH IN ADVANCE TO PROVIDE TIME FOR INSPECTION.
4. NO WATER MAY BE ADDED AFTER A SUPERPLASTICIZER.
5. CONCRETE SHALL BE CONVEYED FROM THE MIXER TO THE FORMS AS RAPIDLY AS PRACTICAL BY METHODS THAT WILL PREVENT SEGREGATION OF THE AGGREGATES OR LOSS OF MORTAR. CONCRETE SHALL BE PLACED WITHIN 1.5 HOURS AFTER THE INTRODUCTION OF CEMENT TO THE AGGREGATE UNLESS AN APPROVED SET–RETARDING ADMIXTURE IS USED IN THE MIX; DURING PERIODS OF HOT WEATHER, IT MAY BE NECESSARY TO REDUCE THIS TIME.
6. CONCRETE SHALL NOT BE DROPPED MORE THAN 5 FEET VERTICALLY. SUPERPLASTICIZED CONCRETE SHALL NOT BE DROPPED MORE THAN 12 FEET VERTICALLY.
7. FORMED WALLS SHALL BE PLACED IN 2' LAYERS UNLESS SUPERPLASTICIZER IS USED, IN WHICH CASE THE MAXIMUM LAYER SHALL BE 5'. EACH LAYER SHALL BE CONSOLIDATED TO ENSURE A GOOD BOND WITH THE PRECEDING LAYER.
8. CONCRETE SHALL BE CONSOLIDATED BY VIBRATING IMMEDIATELY AFTER PLACEMENT AND EXTEND A MINIMUM OF 6" INTO THE PREVIOUSLY CONSOLIDATED LAYER.
9. CONCRETE SHALL BE WORKED INTO CORNERS, ANGLES, AND ALL AROUND REINFORCEMENT AND EMBEDDED ITEMS IN A MANNER THAT PREVENTS SEGREGATION OR THE FORMATION OF "HONEYCOMBING".
10. VIBRATION SHALL NOT BE USED TO MAKE CONCRETE FLOW.
11. IF THE SURFACE OF A PREVIOUSLY PLACED LAYER OF CONCRETE HAS TAKEN A SET TO THE DEGREE THAT IT WILL NOT MIX WITH THE PRECEDING LAYER WHEN VIBRATED, THE CONTRACTOR SHALL DISCONTINUE PLACING CONCRETE AND FORM A CONSTRUCTION JOINT TO AVOID A "COLD JOINT". VINYL WATERSTOP AND FORM MATERIAL SHALL BE ON SITE PRIOR TO STARTING THE PLACEMENT OF ANY CONCRETE.
12. THE LANDOWNER HAS THE OPTION OF HAVING GROOVES FLOATED OR CUT INTO THE STRUCTURE FLOOR(S) FOR ADDED TRACTION FOR ANIMALS AND EQUIPMENT. THIS DECISION WILL BE CONVEYED TO THE CONTRACTOR(S) DURING PRICE SOLICITATION.

CURING

1. CONCRETE SHALL BE ALLOWED TO CURE AT LEAST 24 HOURS PRIOR TO BEGINNING FORMING OR REINFORCEMENT PLACEMENT FOR ADJACENT CONSTRUCTION.
2. NO EQUIPMENT SHALL BE ALLOWED ON CONCRETE SLABS OR FLOORS UNTIL THE CONCRETE HAS CURED FOR A MINIMUM OF 7 DAYS. THIS INCLUDES ANY MOTORIZED MATERIAL HANDLING EQUIPMENT, PALLETS OF FORMS, ETC. SKID LOADERS USED FOR TRANSPORTING CONCRETE INTO FORMS SHALL NOT BE ALLOWED ON SLABS OR FLOORS FOR A MINIMUM OF 14 DAYS.
3. FORMS FOR WALLS SHALL NOT BE REMOVED FOR AT LEAST 24 HOURS AFTER PLACING THE CONCRETE. IF FORMS ARE REMOVED IN LESS THAN 7 DAYS, THE EXPOSED CONCRETE SHALL BE SPRAYED WITH CURING COMPOUND.
4. CURING COMPOUND SHALL BE APPLIED IN A UNIFORM LAYER OVER ALL SURFACES REQUIRING PROTECTION AT A RATE AS DESIGNATED BY THE MANUFACTURER. CURING COMPOUND SHALL BE REAPPLIED IF DISTURBED WITHIN 3 HOURS AFTER BEING APPLIED.
5. WALLS SHALL BE ALLOWED TO CURE FOR A MINIMUM OF 7 DAYS BEFORE INSTALLING "DRILL SET" POST BRACKET ANCHORS. WALLS SHALL BE ALLOWED TO CURE FOR A MINIMUM OF 3 DAYS BEFORE INSTALLING POSTS IN/ON "WET SET" BRACKETS.
6. ALL WALL TIES, HONEY–COMBING, AND AIR HOLES > 3/4" SHALL BE PARGED WITH NON–SHRINK GROUT.
7. RANDOM CRACKING IN THE WALLS AND FLOOR SHALL BE EVALUATED AND DETERMINED IF THE CONCRETE NEEDS TO BE REMOVED OR REPAIRED. REMOVAL AND REPAIR SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND AT NO INCREASE IN COST.
8. IF MAJOR REPAIRS ARE REQUIRED, THE CONTRACTOR SHALL PREPARE A WRITTEN REPAIR PLAN WITH ALL MATERIALS AND METHODS CLEARLY STATED AND SHALL BE APPROVED BY THE ENGINEER OF AUTHORITY BEFORE PROCEEDING WITH THE REPAIR.

JOINTS

1. BEFORE NEW CONCRETE IS PLACED ON OR AGAINST CONCRETE THAT HAS SET, THE SURFACE OF CONSTRUCTION JOINTS SHALL BE CLEANED OF ALL LAITANCE AND DEBRIS BY HIGH–PRESSURE WATER CUTTING, WASHING AND WIRE–BRUSHING, OR AS APPROVED BY THE ENGINEER. THE SURFACE OF THE IN–PLACE CONCRETE SHALL BE CUT TO EXPOSE CLEAN, SOUND AGGREGATE, BUT NOT SO DEEP TO UNDERCUT THE EDGES OF THE LARGE AGGREGATE. ALL CONSTRUCTION JOINTS SHALL BE WETTED FOR AT LEAST 1–HOUR PRIOR TO NEW PLACEMENT AND STANDING WATER SHALL BE REMOVED.
2. SLAB CONTROL JOINTS SHALL BE SAW–CUT AS SOON AS POSSIBLE, BUT NO LATER THAN 24 HOURS AFTER PLACEMENT OF THE CONCRETE, AT THE INTERVALS INDICATED ON THE DRAWINGS. ALL JOINTS SHALL BE WATER TIGHT AND AS SHOWN ON THE DETAIL DRAWINGS. THE SAW–CUTS SHALL BE THOROUGHLY CLEANED AND DRIED SO THE SEALANT AND PRIMER WILL BOND TO THE CONCRETE.
3. FOR THE JOINTS IN THE DRAWINGS THAT CALL FOR AN ELASTOMERIC SEALANT, THE SEALANT SHALL MEET THE REQUIREMENTS STATED IN THE CONSTRUCTION SPECIFICATION, INCLUDED IN THIS DESIGN PACKAGE, AND SHALL ALSO MEET THE FOLLOWING: THE SEALANT SHALL BE TYPE S (SINGLE COMPONENET), CLASS 25, AND MEET THE REQUIREMENT FOR TYPE (ABLE TO BE IMMERSED IN LIQUID). SOME SEALANTS REQUIRE A PRIMER TO BE USED BEFORE THE SEALANT IS APPLIED; PRIMERS SHALL BE USED NO MATTER IF THE JOINT IS LOCATED IN A "SUBMERGED" CONDITION OR NOT. IT IS RECOMMENDED THAT THE PRIMER IS SUPPLIED BY THE SAME MANUFACTURER AS THE SEALANT, THIS WILL ENSURE THAT THE SEALANT AND PRIMER ARE COMPATIBLE.

CONCRETE TESTING

1. CONCRETE TO BE TESTED USING THE FOLLOWING CRITERIA.
   - 1.1 (4) CONCRETE TEST CYLINDERS TAKEN EVERY 50 YDS^3.
     - 1.1.1 (3) CYLINDERS FROM EACH SET TO BE BROKEN AT 28 DAYS, RESERVE (1) CYLINDER FROM EACH SET FOR A 56 DAY BREAK IF NECESSARY.
   - 1.2 SLUMP, AIR ENTRAINMENT, AND CONCRETE TEMPERATURE SHALL BE RECORDED EVERY 50 YDS^3.
   - 1.3 ALL CONCRETE FOR TESTING SHALL BE TAKEN FROM THE DISCHARGE END OF THE PUMP TRUCK.
2. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AN ACI CERTIFIED TECHNICIAN FOR FIELD TESTING OF THE CONCRETE. THE CONCRETE SUPPLIER CANNOT TEST THEIR OWN CONCRETE.
3. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT THE CONCRETE MEETS THE DESIGN REQUIREMENTS. THE CONTRACTOR SHALL TEST THE CONCRETE AS NEEDED; SLUMP, AIR ENTRAINMENT, CONCRETE TEMPERATURE, AND CYLINDERS. ALL CONCRETE FOR TESTING OR MAKING CYLINDERS SHALL BE TAKEN FROM THE DISCHARGE END OF THE PUMP TRUCK. THE SITE INSPECTOR MAY TEST THE CONCRETE AS THEY FEEL THE NEED TO DO SO. THE CONTRACTOR IS NOT TO RELY ON THE INSPECTOR TO PROVIDE THE TESTING SERVICE.

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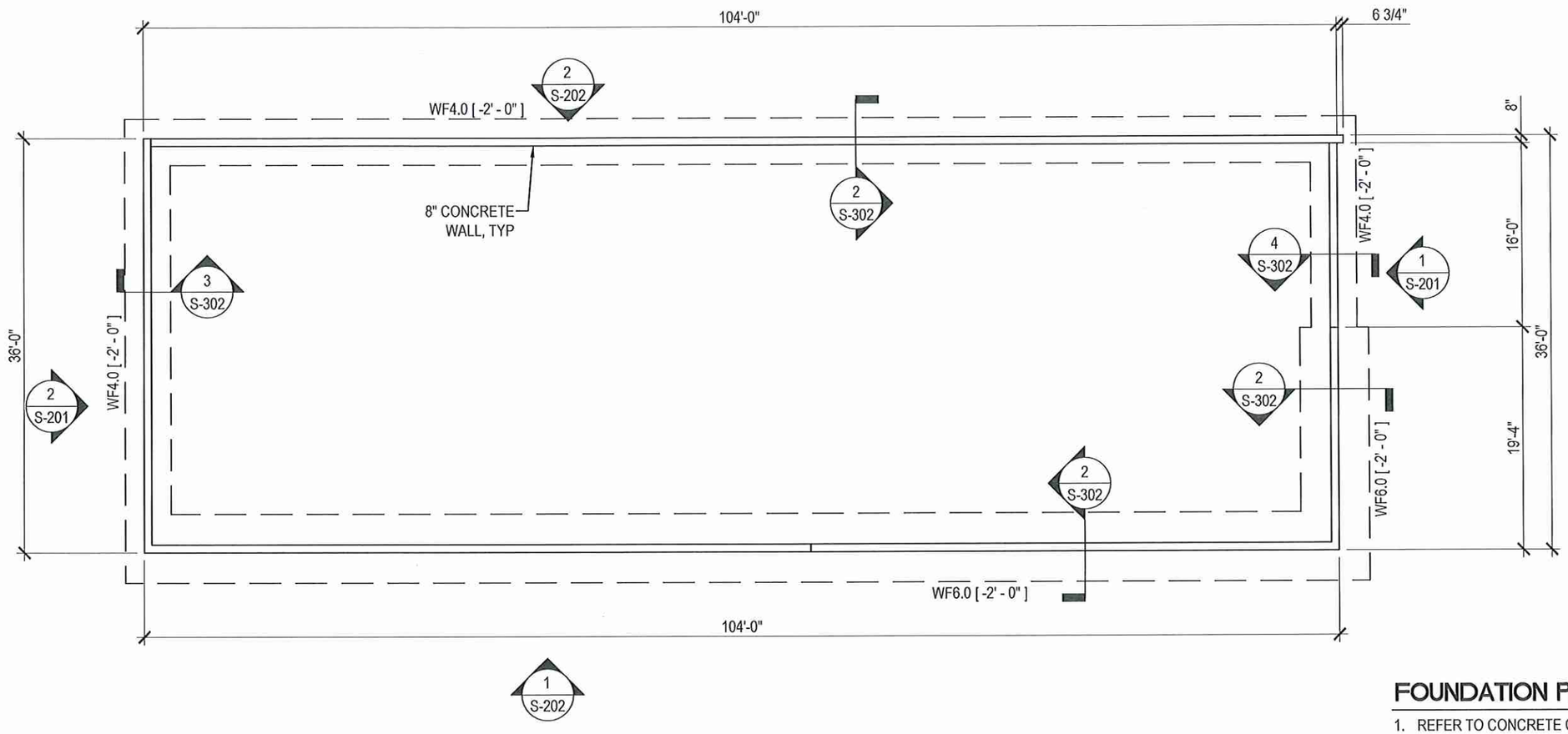
CONCRETE CONSTRUCTION NOTES

Date: 02-19-2026
Project No.: 6403-127
Sheet No.: S-004

FINAL SUBMISSION



WALL FOOTING SCHEDULE

MARK	WIDTH	THICKNESS	LONGITUDINAL REINF	TRANSVERSE REINF
WF4.0	4'-0"	1'-0"	(5) #4 T&B	#4 @ 9" OC T&B
WF6.0	6'-0"	1'-0"	(8) #4 T&B	#4 @ 9" OC T&B

1. ALL FOOTINGS SHALL BE CENTERED UNDER WALLS, UNO

FOUNDATION PLAN NOTES

1. REFER TO CONCRETE CONSTRUCTION NOTES
2. COORDINATE ALL DIMENSIONS WITH CIVIL PLANS AND DETAILS.
3. VERIFY ALL DIMENSIONS WITH EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
4. FOOTING ELEVATIONS PROVIDED AND NOTED AS [X'-X"] ARE IN RESPECT TO TOP OF SLAB ELEVATION. SEE PLAN FOR REFERENCE.

1 FOUNDATION PLAN
SCALE: 3/32" = 1'-0"

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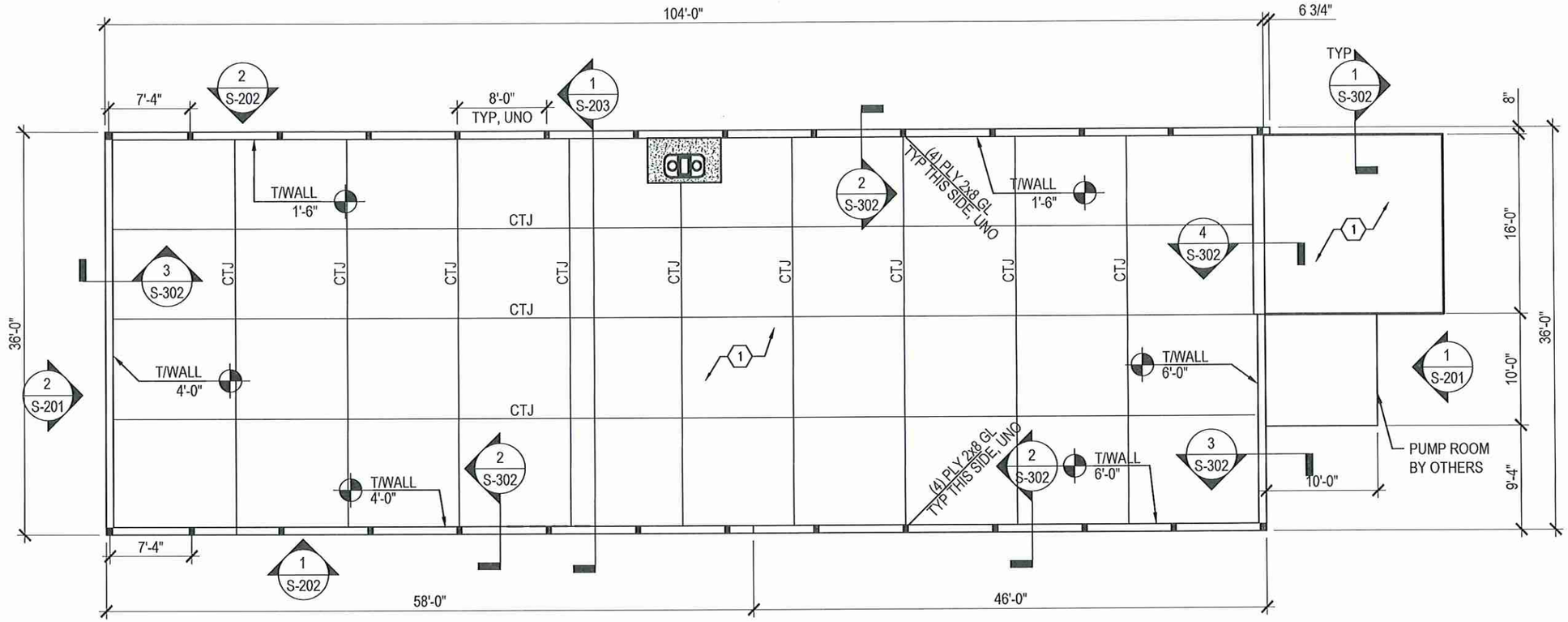
FOUNDATION PLAN

Date: 02-19-2026
Project No.: 6403-127
Sheet No.: S-101

FINAL SUBMISSION



SLAB PLAN NOTES

1. REFER TO CONCRETE CONSTRUCTION NOTES
2. COORDINATE ALL DIMENSIONS WITH CIVIL PLANS AND DETAILS.
3. VERIFY ALL DIMENSIONS WITH EXISTING CONDITIONS PRIOR TO CONSTRUCTION.

SLAB PLAN KEY NOTES

(1) 5" SLAB-ON-GRADE W/ (1) LAYER WWR 6x6-W2.9xW2.9 @ MID-DEPTH

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1 SLAB PLAN
SCALE: 3/32" = 1'-0"

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SLAB PLAN

Date: 02-19-2026
Project No.: 6403-127
Sheet No.: **S-102**

FINAL SUBMISSION

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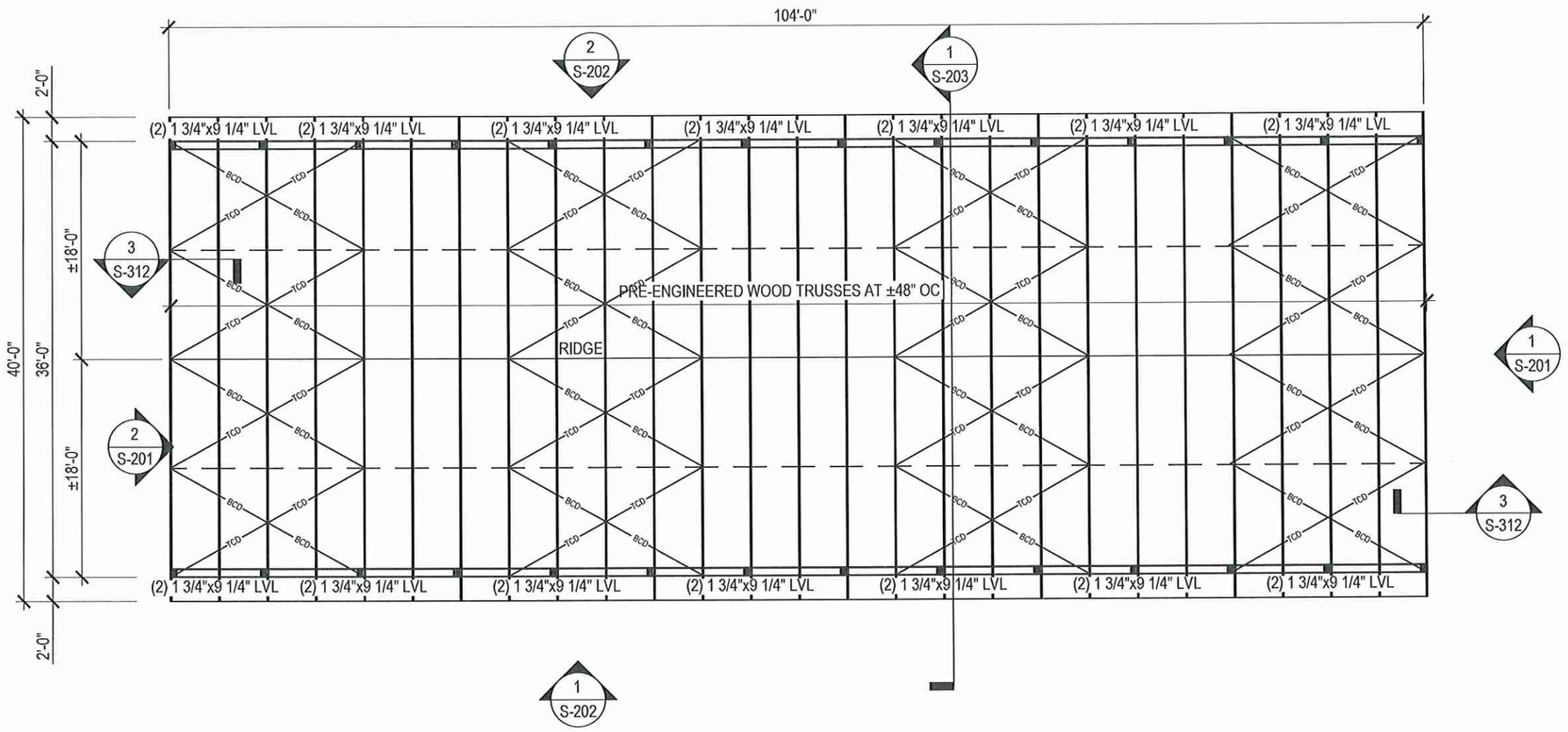

ROOF FRAMING PLAN NOTES

1. REFER TO WOOD TRUSS AND WOOD CONSTRUCTION NOTES
2. COORDINATE ALL DIMENSIONS WITH CIVIL PLANS AND DETAILS.
3. VERIFY ALL DIMENSIONS WITH EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
4. ALL ROOF BRACING SHALL BE PER DESIGN OF TRUSS BY TRUSS MANUFACTURER.

BRACING LEGEND

ALL BRACING SHALL BE PER TRUSS MANUFACTURERS RECOMMENDATIONS. SHOWN ON PLANS AS SCHEMATIC.

—TCD—TCD— TOP CHORD DIAGONAL BRACING

—BCD—BCD— BOTTOM CHORD DIAGONAL BRACING

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
MOLLYE MIKULA HOLBROOK
ENGINEER
PE094304
02/19/2026

1 ROOF FRAMING PLAN

SCALE: 1/8" = 1'-0"

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MARK	DATE	COMMENTS
3	02-19-2026	FINAL SUBMISSION
2	01-09-2026	FINAL DRAFT REVIEW
1	10-15-2025	I&E SUBMISSION
0	09-03-2025	DEP SUBMISSION

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ROOF FRAMING PLAN

Date: 02-19-2026
Project No.: 6403-127
Sheet No.: **S-103**

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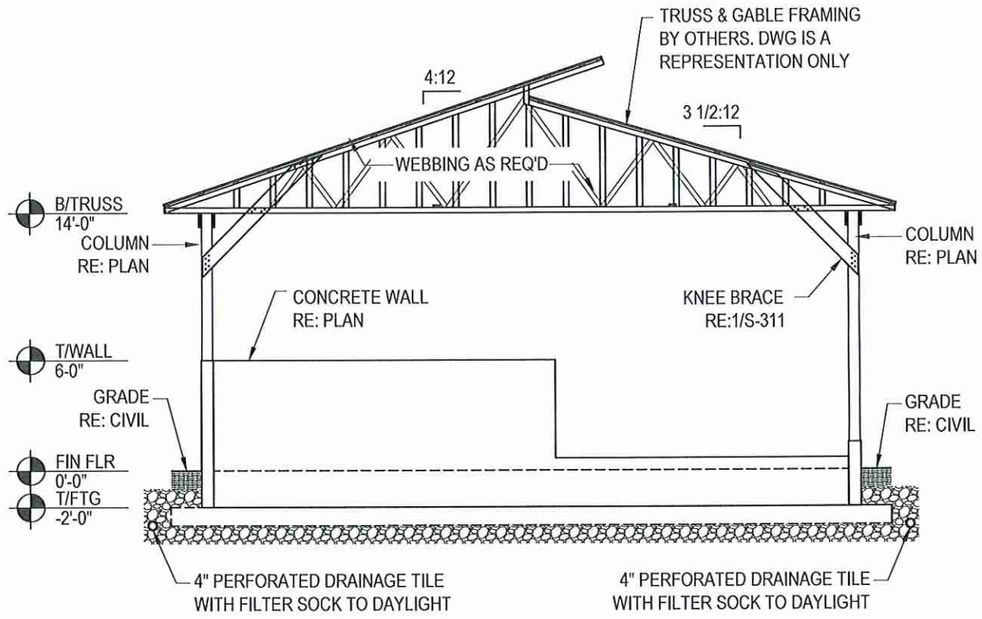
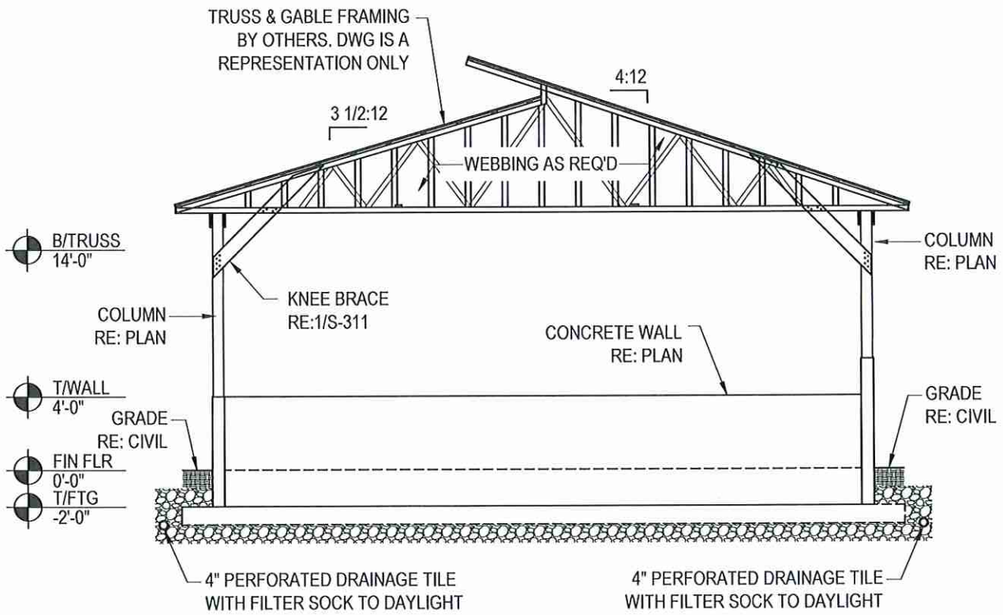


1 PLAN EAST GABLE END FRAMING ELEVATION

SCALE: 1/8" = 1'-0"



2 PLAN WEST GABLE END FRAMING ELEVATION

SCALE: 1/8" = 1'-0"

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GABLE END ELEVATIONS

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PE094304
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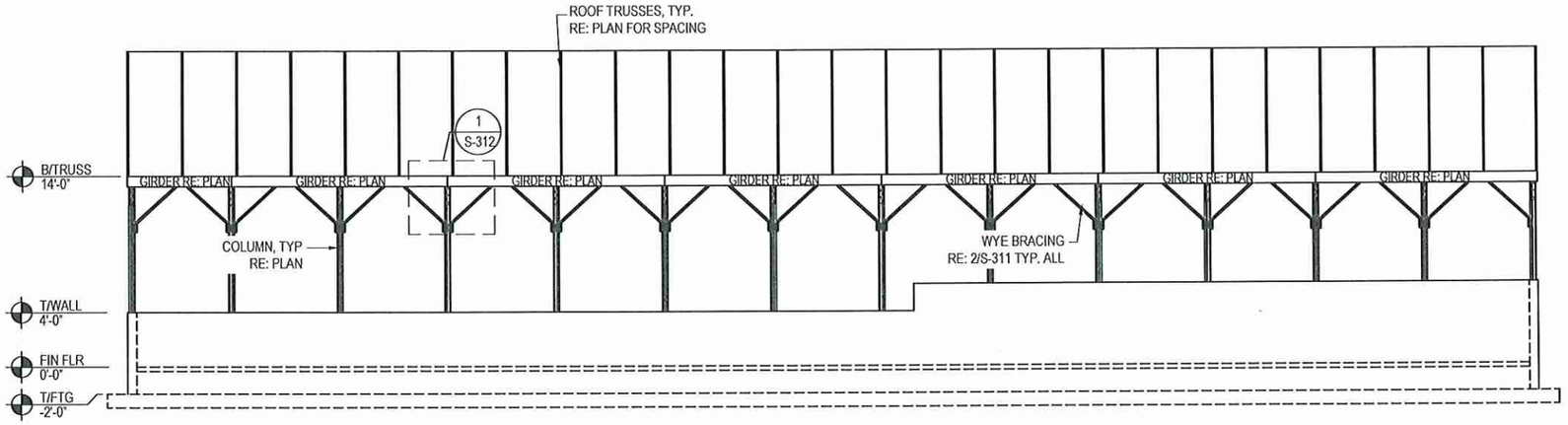
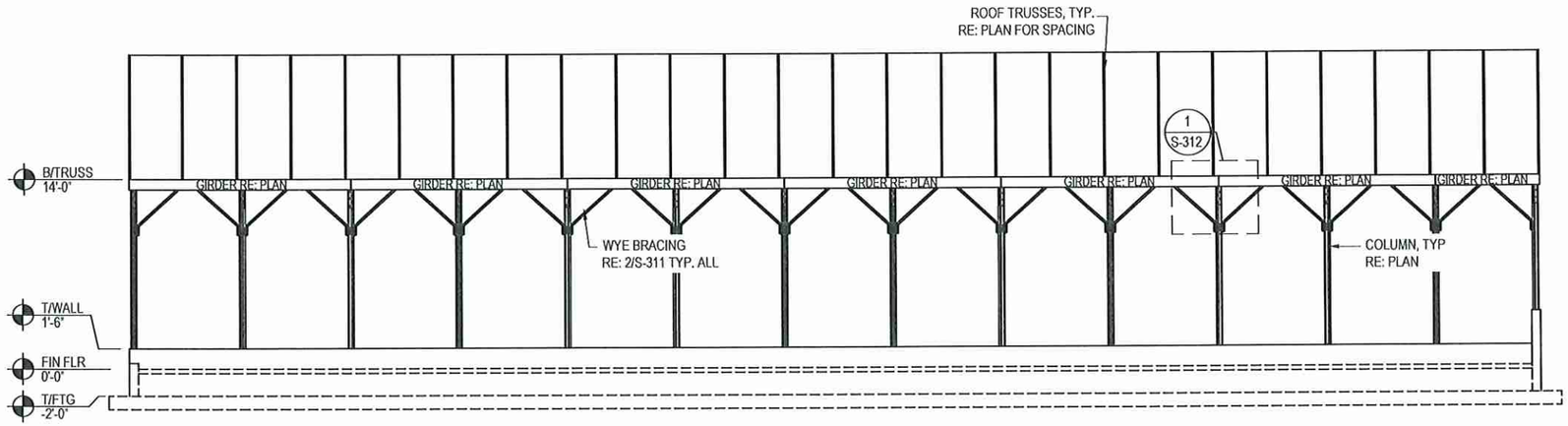
FINAL SUBMISSION



1 PLAN SOUTH FRAMING ELEVATION

SCALE: 3/32" = 1'-0"



2 PLAN NORTH FRAMING ELEVATION

SCALE: 3/32" = 1'-0"

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FRAMING ELEVATIONS

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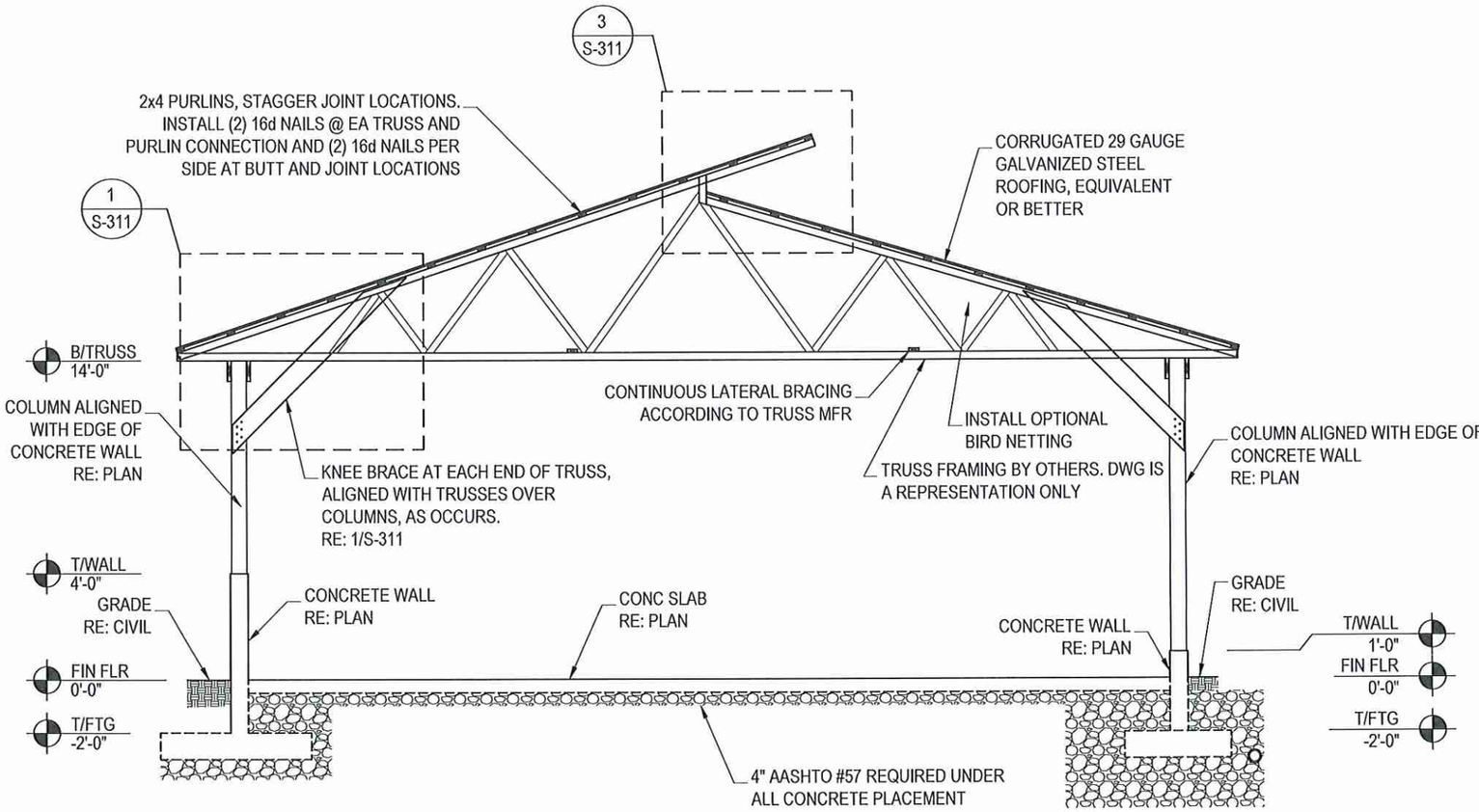
02/19/2026

Date: 02-19-2026
Project No.: 6403-127
Sheet No.: **S-202**

FINAL SUBMISSION



1 TYPICAL TRUSS ELEVATION

SCALE: 3/16" = 1'-0"

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FRAMING ELEVATIONS

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02/19/2026

Date: 02-19-2026
Project No.: 6403-127
Sheet No.: **S-203**

FINAL SUBMISSION

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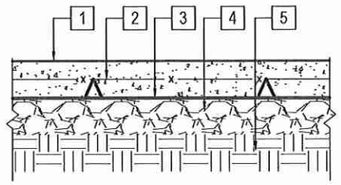
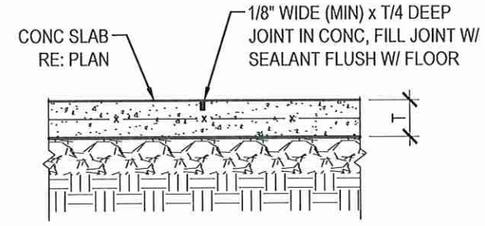


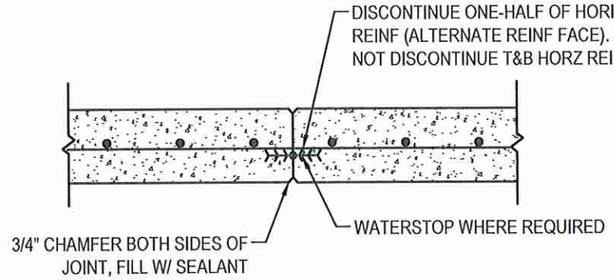
NOTES:
1. CONCRETE SLAB, REFER TO PLAN FOR THICKNESS.
2. STEEL REINFORCEMENT, REFER TO PLAN FOR SIZE, SPACING AND LOCATION.
3. VAPOR RETARDER, REFER TO STRUCTURAL NOTES. RETARDER NOT REQUIRED AT EXTERIOR SLABS UNLESS NOTED OTHERWISE.
4. GRANULAR BASE MATERIAL, 4" AASHTO #57.
5. PREPARED SUBGRADE.

1 / S-301 TYPICAL SLAB CONSTRUCTION (UNO)
SCALE: NTS



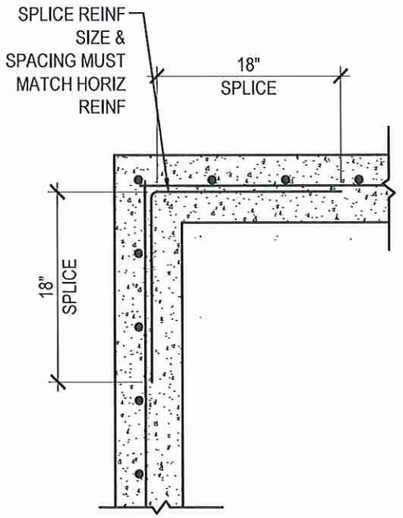
NOTES:
1. REFER TO PLAN FOR JOINT LOCATIONS.
2. TYPICAL FOR SLABS 6" IN THICKNESS AND UNDER.

2 / S-301 TYPICAL CONTRACTION JOINT (CTJ)
SCALE: NTS

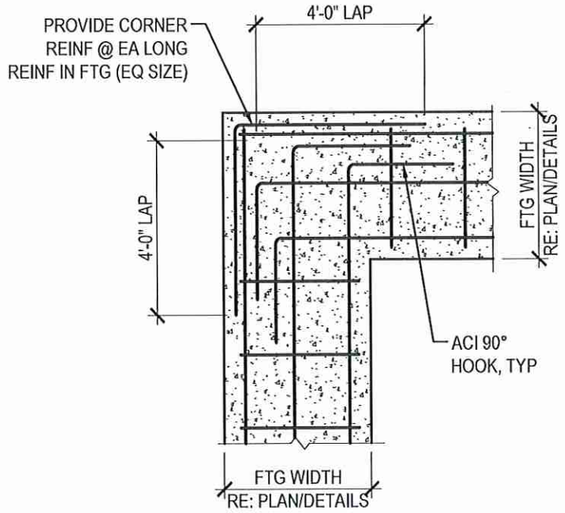


NOTES:
1. CONTROL JOINT LOCATIONS SHALL BE SPACED APPROXIMATELY 16 FEET ON CENTER, UNLESS NOTED OTHERWISE.
2. PRIOR TO CONCRETE WALL PLACEMENT, CONSULT ENGINEER OF RECORD FOR APPROVAL OF CONTROL JOINT LOCATIONS.
3. CHAMFER STRIPS AND SEALANT MAY BE OMITTED ON FACED HIDDEN BY BACKFILL.

3 / S-301 TYPICAL WALL CONTROL JOINT - (1) LAYER REINF (CLJ)
SCALE: NTS



4 / S-301 TYP CONC WALL CORNER REINF
SCALE: NTS



5 / S-301 TYPICAL REINF AT FOOTING CORNER
SCALE: NTS

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FOUNDATION SECTIONS

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PE094304
02/19/2026

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Project No.: 6403-127
Sheet No.: **S-301**

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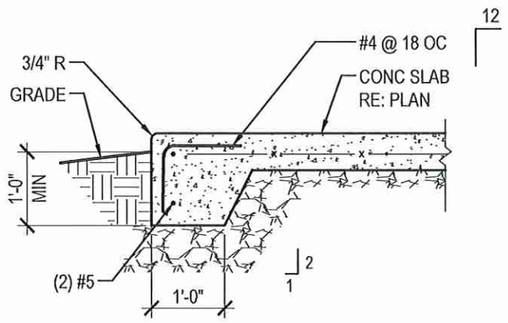
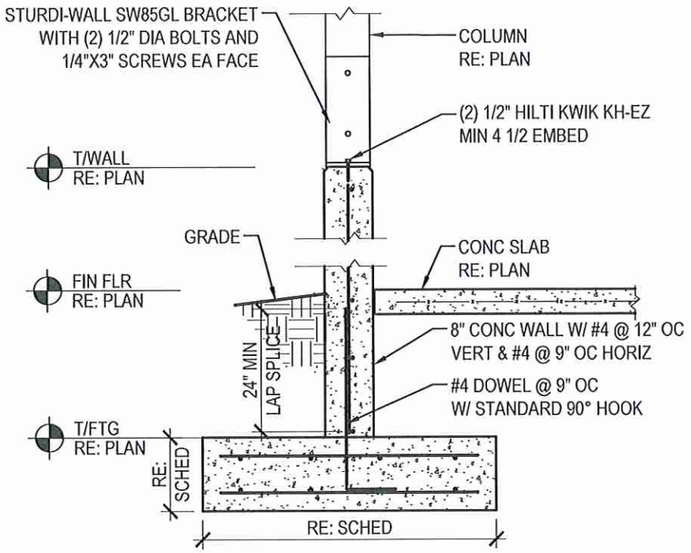
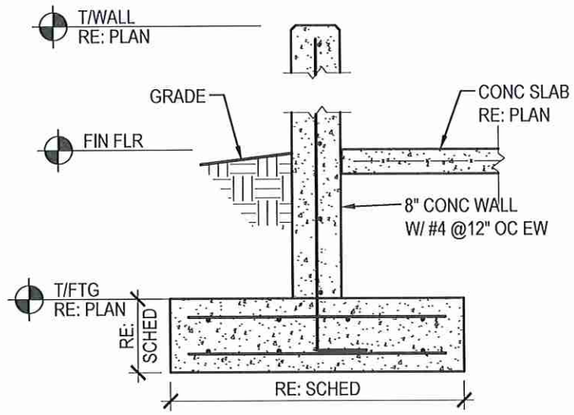


1 S-302 TYPICAL TURN-DOWN SLAB DETAIL
SCALE: 1/2" = 1'-0"

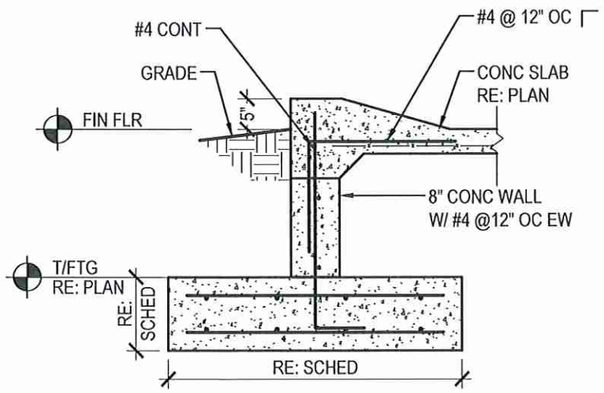


NOTE: INSTALL STURDI-WALL SW60 AND SW 80
BRACKET AT TWO SIDES OF ALL CORNER POSTS.
RE: PLAN FOR LOCATIONS

2 S-302 TYPICAL FOUNDATION SECTION
SCALE: 1/2" = 1'-0"



3 S-302 TYPICAL FOUNDATION SECTION
SCALE: 1/2" = 1'-0"



4 S-302 TYPICAL FOUNDATION @ ENTRANCE
SCALE: 1/2" = 1'-0"

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Project No.: 6403-127
Sheet No.: **S-302**

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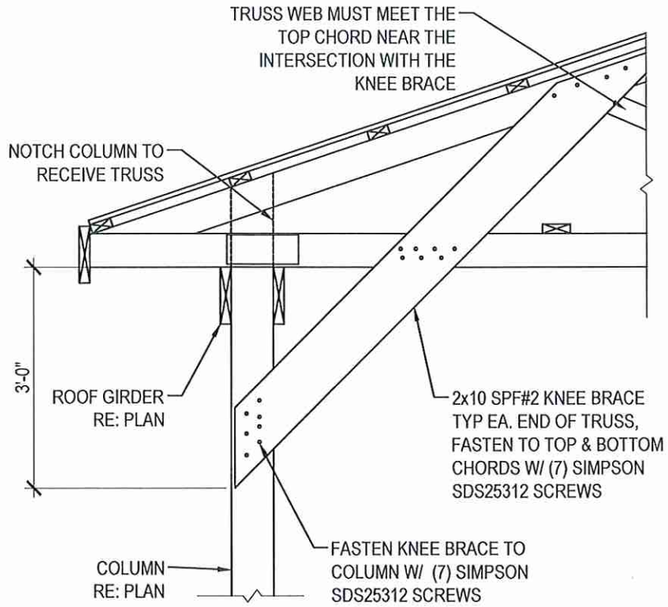
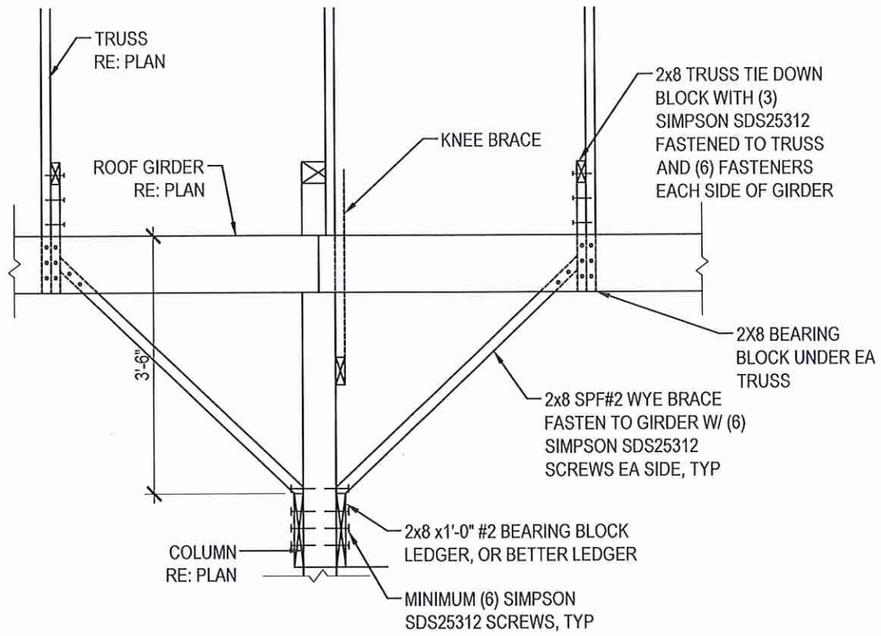
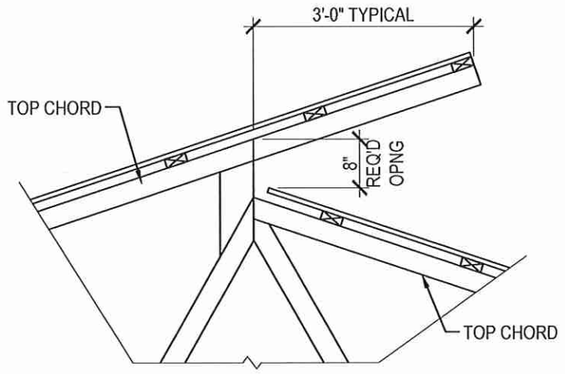


1 S-311 TYPICAL KNEE BRACE DETAIL
SCALE: 1/2" = 1'-0"



2 S-311 TYPICAL WYE BRACE DETAIL
SCALE: 1/2" = 1'-0"



3 S-311 VENTILATION RIDGE DETAIL
SCALE: 1/2" = 1'-0"

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Date: 02-19-2026
Project No.: 6403-127
Sheet No.: **S-311**

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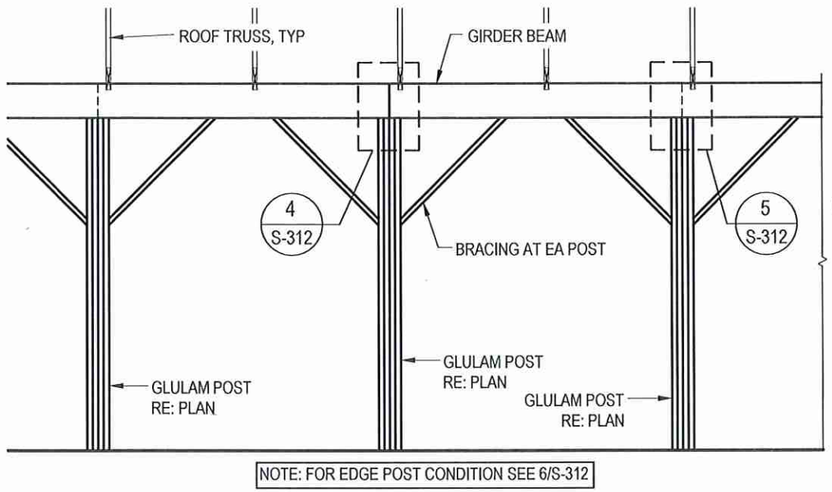
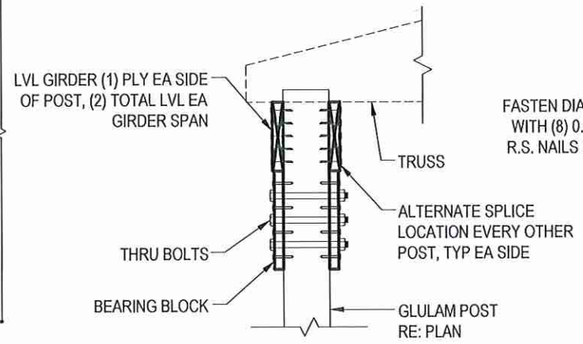
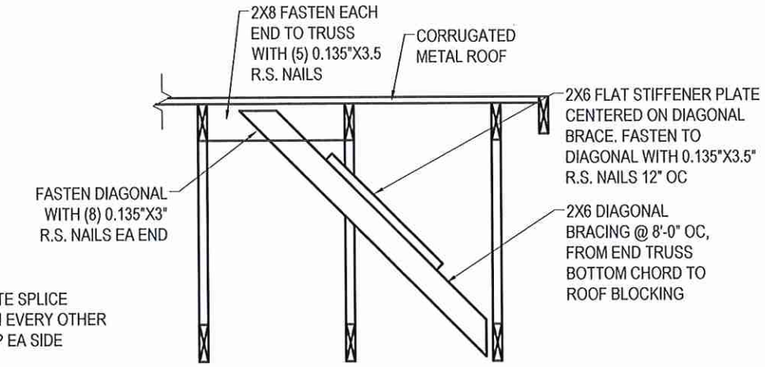


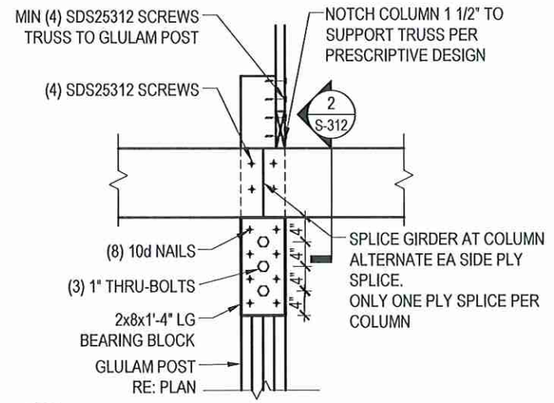
1 S–312 SIDEWALL FRAMING ELEVATION
SCALE: 1/2" = 1'–0'



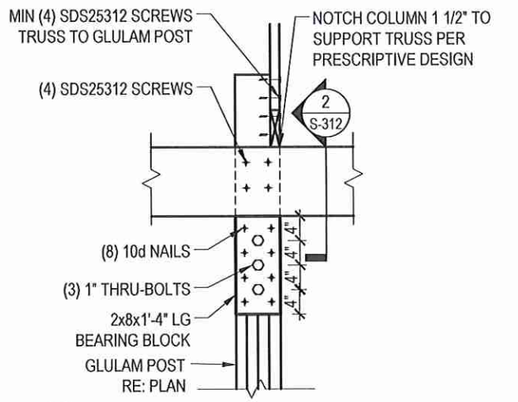
2 S–312 TYPICAL GIRDER CONNECTION SECTION
SCALE: 1/2" = 1'–0'



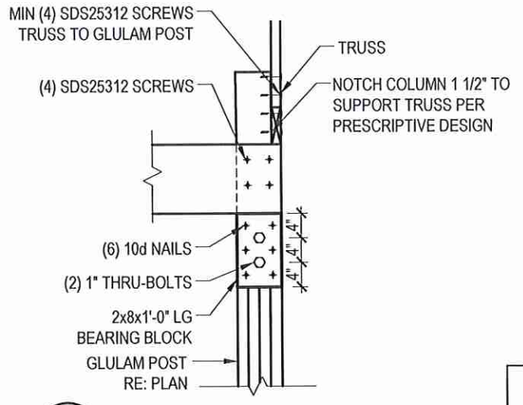
3 S–312 ENDWALL BRACE DETAIL
SCALE: 1/2" = 1'–0'



4 S–312 NON-CONTINUOUS SPAN GIRDER CONNECTION
SCALE: 1/2" = 1'–0'



5 S–312 CONTINUOUS SPAN GIRDER CONNECTION
SCALE: 1/2" = 1'–0'



6 S–312 END POST GIRDER CONNECTION
SCALE: 5

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PE094304
02/19/2026

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Sheet No.: S-312

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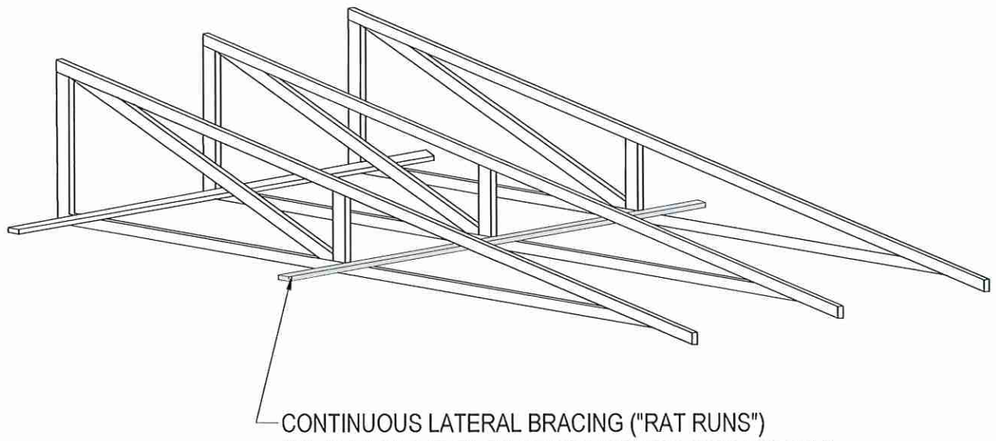
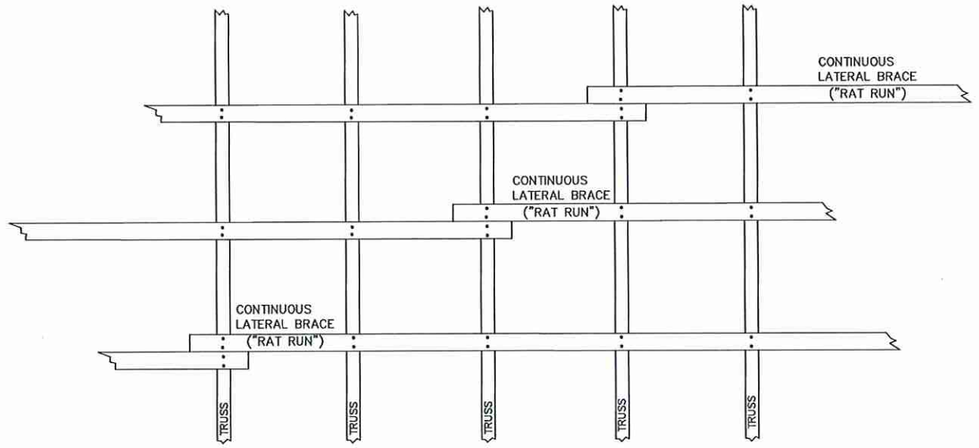
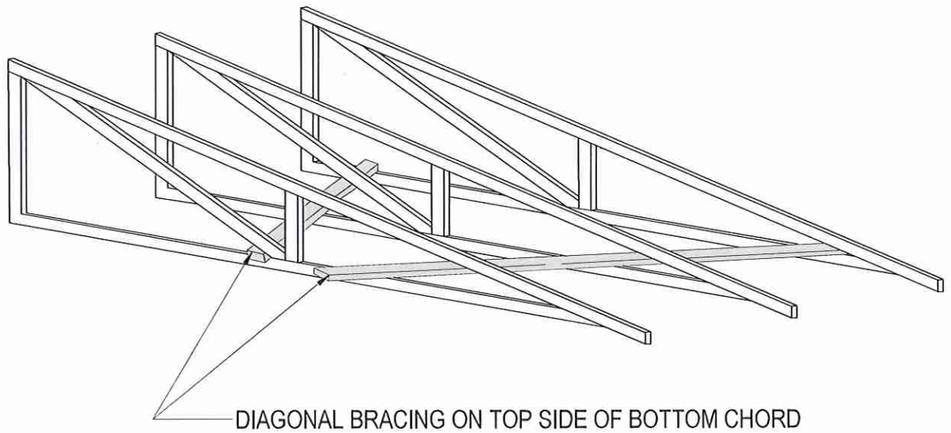


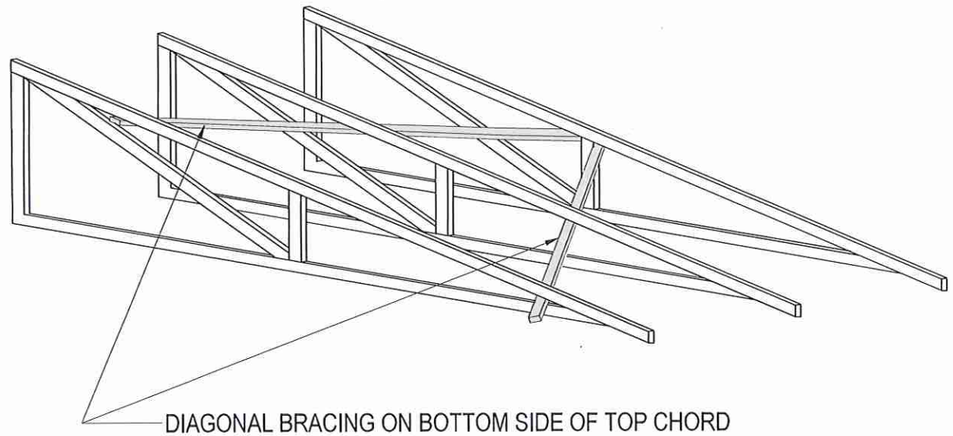
CONTINUOUS LATERAL BRACING ("RAT RUNS")
((2) 16d NAILS @ EACH BRACE / TRUSS CONNECTION)



JOINTS IN CONTINUOUS LATERAL BRACES SHALL BE STAGGERED,
SO THEY DO NOT LINE UP WITH THE NEXT TRUSS.
AT A JOINT, EACH BOARD SHALL EXTEND FULLY PAST THE TRUSS,
TO ALLOW FOR A TWO NAIL CONNECTION.
THESE BRACES ARE AS PER TRUSS MFR REQUIREMENTS
SHOWN ON THE TRUSS DESIGN.



DIAGONAL BRACING ON TOP SIDE OF BOTTOM CHORD
AT LOCATIONS SHOWN ON DRAWINGS
((2) 16d NAILS @ EACH BRACE / TRUSS CONNECTION)



DIAGONAL BRACING ON BOTTOM SIDE OF TOP CHORD
AT LOCATIONS SHOWN ON DRAWINGS
((2) 16d NAILS @ EACH BRACE / TRUSS CONNECTION)

1 / S-401 CHORD AND DIAGONAL BRACING
SCALE: NTS

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REGISTERED PROFESSIONAL ENGINEER
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BUILDING DETAILS

Date: 02-19-2026
Project No.: 6403-127
Sheet No.: **S-401**

FINAL SUBMISSION

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