FINAL DEVELOPMENT PLAN FOR

BERKSHIRE TOWNSHIP RECREATION COURTS

QUARTER-TOWNSHIP 1 & TOWNSHIP 4, RANGE 17
PART OF FARM LOT 6, U.S.M.L.
BERKSHIRE TOWNSHIP, DELAWARE COUNTY, OHIO

OWNER

BERKSHIRE TOWNSHIP
ATTEN: TYLER CANE, TOWNSHIP ADMINISTRATOR
1454 ROME CORNERS ROAD
GALENA, OHIO 43021
CELL: 614-371-4075
EMAIL: tlane@berkshiretwp.org

BENCHMARKS (PROVIDED BY OWNER)

BM#1
I.P.S. PIN
N 209845.48, E 1852997.02
ELEV=973.02

BM#2
CAPPED IRON PIN SET
N 209954.25, E1853551.93
ELEV=973.31

BM#3
STORM CATCH BASIN, TOP OF CASTING
N 210230.91, E1853713.65
ELEV=969.66

1. SURVEY INFORMATION SHOWN HEREON AND UPON WHICH ENGINEERING DESIGN IS BASED WAS PROVIDED BY PROJECT OWNER AND /OR CLIENT.
2. TERRAIN EVOLUTION ASSUMES NO LIABILITY, EXPRESSED OR IMPLIED, OF OF THE ACCURACY OF SURVEY INFORMATION PROVIDED.
3. CONTRACTOR TO FIELD VERIFY HORIZONTAL AND VERTICAL ACCURACY OF ALL BENCHMARKS, EXISTING TOPOGRAPHY, EXISTING UTILITIES AND EXISTING FEATURES ILLUSTRATED WITHIN THIS PLAN.
4. BENCHMARKS 1 & 2 PINS SET AS REFERENCE POINTS FOR THE PAVILION PROJECT, AND NOT FOR THIS PROJECT SPECIFICALLY. CONTRACTOR TO VERIFY BENCHMARKS ARE STILL IN PLACE IN THE FIELD WITH CORRECT ELEVATION.

FLOODPLAIN NOTE

THE SITE IS LOCATED IN FLOOD ZONE "X" AREA OF MINIMAL FLOOD HAZARD PER F.E.M.A. COMMUNITY PANEL NO. 39041C0260K DATED 4/16/2009.

EXISTING UTILITY NOTES

THE IDENTITY AND LOCATION OF THE EXISTING UNDERGROUND UTILITY FACILITIES KNOWN TO BE LOCATED IN THE CONSTRUCTION AREA HAVE BEEN SHOWN ON THE PLANS BASED ON SURVEY PROVIDED BY OWNER, AS WELL AS AS-BUILT DRAWINGS PROVIDED BY DEL-CO AND DELAWARE COUNTY. DELAWARE COUNTY AND/OR THE DESIGN ENGINEER ASSUMES NO RESPONSIBILITY AS TO THE ACCURACY OF THE UNDERGROUND FACILITIES SHOWN ON THE PLANS. SUPPORT, PROTECTION AND RESTORATION OF ALL EXISTING UTILITIES LOCATION, AND APPURTENANCES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE COST OF THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE VARIOUS ITEMS.

THE CONTRACTOR SHALL CAUSE NOTICE TO BE GIVEN TO THE REGISTERED UNDERGROUND UTILITY PROTECTION SERVICES (TELEPHONE 800-362-2764 - TOLL FREE) AND THE OWNER'S OF UNDERGROUND UTILITY FACILITIES SHOWN ON THE PLANS WHO ARE NOT MEMBERS OF A REGISTERED UNDERGROUND PROTECTION SERVICE IN ACCORDANCE WITH SECTION 153.64 OF THE REVISED CODE. THE ABOVE MENTIONED NOTICE SHALL BE GIVEN AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION.

THE FOLLOWING UTILITY COMPANIES MAY HAVE FACILITIES LOCATED WITHIN THE PROJECT LIMITS:

COLUMBIA GAS OF OHIO
1600 DUBLIN ROAD
COLUMBUS, OH 43215
ATTN: TODD SCHWARZ
PH: (614)-460-5400 EXT. 3041

AMERICAN ELECTRIC POWER COMPANY
850 TECH CENTER DRIVE
GAHANNA, OH 43230-6605
ATTN: RICK ECKLE
PH: (614)-883-6829

CENTURYLINK
441 WEST BROAD STREET
PATASKALA, OHIO 43062
ATTN: DEE REED
PH: (740)-927-8282

SPECTRUM
3760 INTERCHANGE ROAD
COLUMBUS, OHIO 43204
ATTN: DOUG KUHN
PH: (614)-255-6337

DEL-CO WATER COMPANY, INC.
6658 OLENTANGY RIVER ROAD
DELAWARE, OH 43015
PH: (740)-548-7746
F: (740)-548-6203

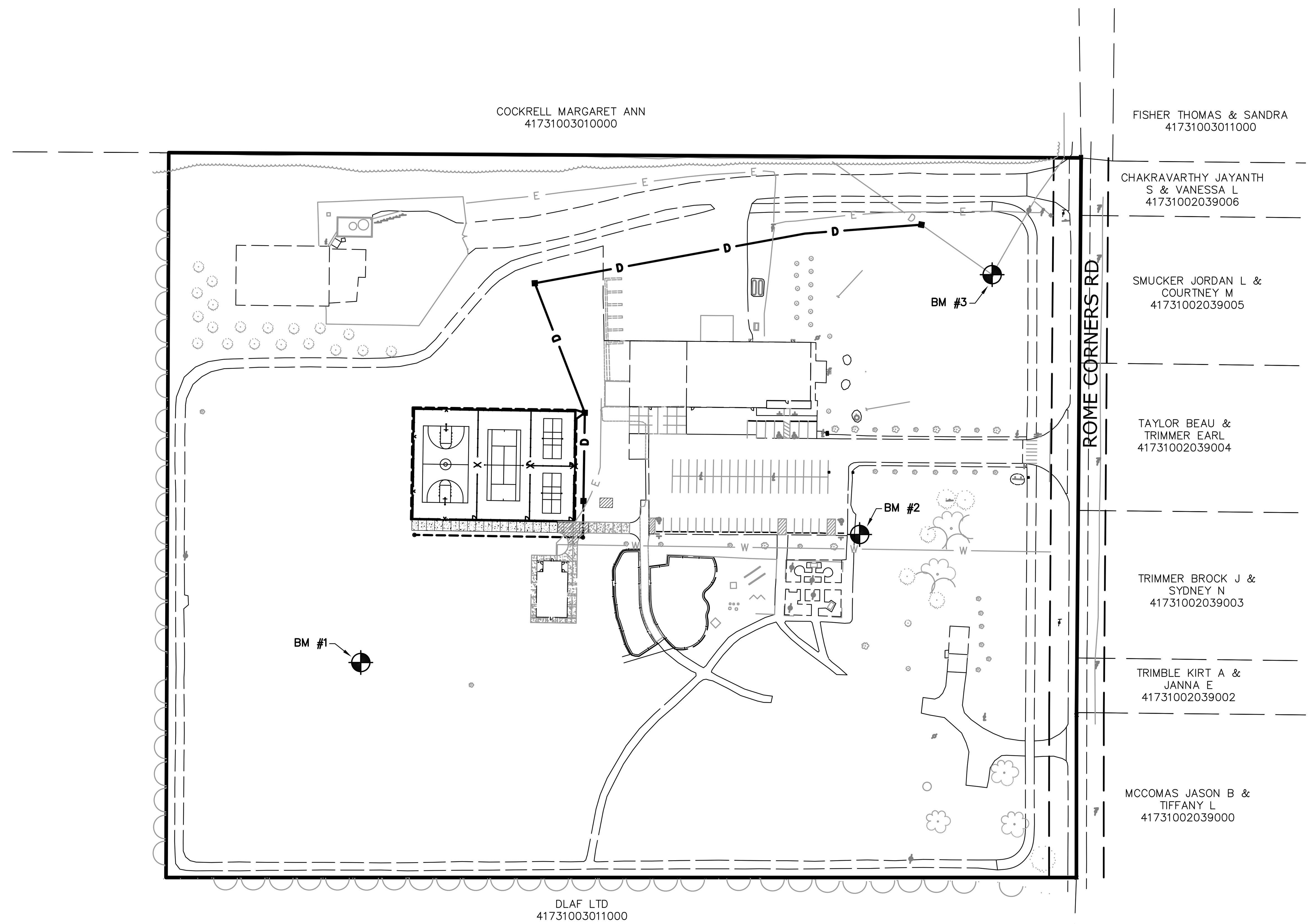
FIRST ENERGY
1040 S. PROSPECT ST.
MARION, OH 43302
ATTN: JEFFREY HALL -COORDINATOR OF ENGINEERING SERVICES
PH: (740)-382-7104

CONSOLIDATED ELECTRIC COMPANY
5255 ST. RT. 95
MT. GILEAD, OH 43338
ATTN: PHIL CASKEY - ENGINEERING
PH: (419)-947-3055

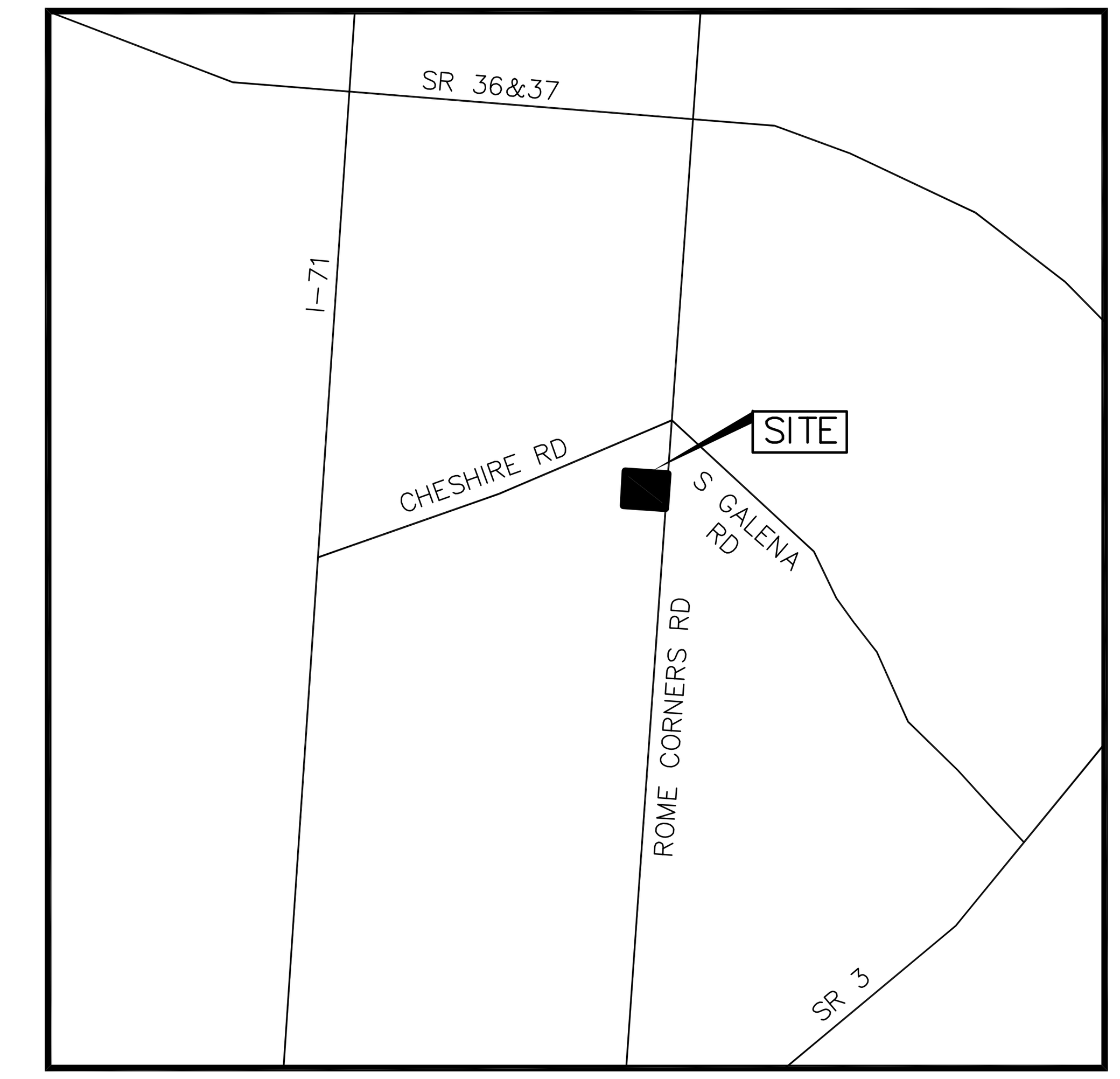
VERIZON
550 LEADER ST.
MARION, OH 43302
ATTN: CHRIS AVERY
PH: (740)-383-0551

DELAWARE COUNTY ENGINEER
50 CHANNING STREET
DELAWARE, OH 43015
PH: (740)-833-2400
F: (740)-833-2399

OHIO Utilities Protection SERVICE
811 or 1-800-362-2764 Call Before You Dig



INDEX MAP
SCALE: 1" = 100'



LOCATION MAP
NOT TO SCALE

SHEET INDEX

STANDARD DRAWINGS

THE STANDARD DRAWINGS AND SUPPLEMENTAL SPECIFICATIONS LISTED BELOW SHALL BE CONSIDERED A PART OF THIS PLAN.

DELAWARE COUNTY ENGINEERING

DCED-R100	DCED-S139
DCED-S133A	DCED-S149
DCED-S133B	DCED-S151

LINKS TO STANDARD DRAWINGS:
https://engineer.co.delaware.oh.us/development/stdroadwaydrawings/
https://engineer.co.delaware.oh.us/development/stdsewerdrawings/

BERKSHIRE TOWNSHIP ADMINISTRATOR   DATE

THIS IS TO CERTIFY THAT GOOD ENGINEERING PRACTICES HAVE BEEN UTILIZED IN THE DESIGN OF THIS PROJECT, INCLUDING THOSE STANDARDS GREATER THAN MINIMUM WHERE, IN MY OPINION, THEY ARE NEEDED TO PROTECT THE SAFETY OF THE PUBLIC. ANY VARIANCES TO THE ABOVE STANDARDS ARE CONSISTENT WITH SOUND ENGINEERING PRACTICE AND ARE NOT DETRIMENTAL TO THE PUBLIC SAFETY AND CONVENIENCE.

TERRAIN EVOLUTION, INC.
720 EAST BROAD STREET
COLUMBUS, OHIO 43215
V: 614.385.1090
F: 614.385.1085

REGISTERED ENGINEER'S SIGNATURE AND SEAL   DATE

GRAPHIC SCALE
100 50 0 100
(IN FEET)
1 inch = 100 ft.

REVISION: DATE / BY
CHANGE ORDER SCHEDULE: DESCRIPTION OF CHANGE / #

TerrainEvolution
Your bridge between Vision and Success
720 East Broad Street | Suite 203 | Columbus, OH 43215
P: 614.385.1090 | F: 614.385.1085 | E: info@terrainevolution.com

BERKSHIRE TOWNSHIP, DELAWARE COUNTY, OHIO
BERKSHIRE TOWNSHIP RECREATIONAL COURTS
1454 ROME CORNERS ROAD
COVER SHEET

DRAWING SET STATUS:
- ☐ PRELIMINARY ENGINEERING SET
- ☐ AGENCY REVIEW SET
- ■ CONSTRUCTION DOCUMENT SET
- ☐ AS-BUILT DOCUMENT SET

DESIGN	DRAFT	CHECK
DGR	DGR	MSW

PROJECT NO.: 25-002
DATE: MARCH, 2025
SCALE: HORIZONTAL: 1" = 100'; VERTICAL: N/A

GENERAL NOTES

1. THE DELAWARE COUNTY DESIGN, CONSTRUCTION AND SURVEYING STANDARDS, LATEST EDITION, TOGETHER WITH THE CITY OF COLUMBUS (C.O.C.) CONSTRUCTION AND MATERIALS SPECIFCATIONS, LATEST EDITION, ALONG WITH THE DELAWARE COUNTY ENGINEER (DCEO) SUPPLEMENTAL SPECIFICATIONS, SHALL GOVERN ALL MATERIALS AND WORKMANSHIP INVOLVED IN THE IMPROVEMENTS SHOWN ON THESE PLANS, UNLESS OTHERWISE NOTED.

2. A PRECONSTRUCTION CONFERENCE SHALL BE HELD AT THE BERKSHIRE TOWNSHIP OFFICE BEFORE ANY WORK IS BEGUN. REPRESENTATIVES OF THE OWNER, DESIGN ENGINEER, AND CONTRACTOR SHALL BE IN ATTENDANCE. A SCHEDULE OF SEQUENCE OF EVENTS DURING CONSTRUCTION MUST BE SUBMITTED FOR REVIEW PRIOR TO THIS MEETING.

3. PROOF SURVEYS ARE REQUIRED TO BE PERFORMED BY THE CONTRACTOR IN ORDER TO DEMONSTRATE CONCLUSIVELY THAT THE FACILITIES ARE CONSTRUCTED TO THE CAPACITY, ELEVATIONS, SLOPES, GRADES AND SIZES SHOWN ON THE THESE PLANS. SUCH SURVEYS SHALL BE CONDUCTED BY A REGISTERED PROFESSIONAL SURVEYOR, SHALL EMPLOY STANDARD TECHNIQUES, AND SHALL PRODUCE AND FURNISH FIELD NOTES TO THE BERKSHIRE TOWNSHIP. REDUCTION OF NOTES AND ANY PLOTTING NECESSARY TO MAKE NOTES INTERPRETABLE SHALL BE COMPLETED BY THE SURVEYOR PERFORMING THE PROOF SURVEY. PROOF SURVEYS SHALL BE IN ADDITION TO, AND SEPARATE FROM, OTHER INSPECTIONS BY THE OWNER. ALL DISCREPANCIES REVEALED IN THE AS-CONSTRUCTED FACILITIES BY THE PROOF SURVEY SHALL BE RECTIFIED BY THE OWNER AND THE PROOF SURVEY RE-PERFORMED IN ORDER TO DEMONSTRATE CONFORMANCE. THE PROOF SURVEY SHALL BE APPROVED BY BERKSHIRE TOWNSHIP, IN WRITING.

4. BE ADVISED: A SUBSURFACE DRAINAGE SYSTEM MAY EXIST ON THIS SITE. REGARDLESS WHETHER OR NOT A STORMWATER FACILITY IS TO BE PLACED ON DRAINAGE MAINTENANCE, THE CONTRACTOR SHALL MAINTAIN ALL EXISTING DRAIN PIPES OR TILES ENCOUNTERED IN THE FIELD AND, IF DAMAGED, REPAIR OR REPLACE THEM IMMEDIATELY WITH THE SAME SIZE AND QUALITY OF MATERIALS AS FOUND. ALL DRAINAGE TILES ENCOUNTERED IN THE FIELD SHALL BE CONNECTED TO THE STORM SEWER SYSTEM AT A STRUCTURE.

5. THE CONTRACTOR SHALL NOTIFY THE BERKSHIRE TOWNSHIP OFFICE FORTY EIGHT (48) HOURS PRIOR TO ANY CONSTRUCTION.

6. THE CONTRACTOR'S BID SHALL BE COMPREHENSIVE AND INCLUDE ALL LABOR AND MATERIALS NECESSARY TO COMPLETE ALL IMPROVEMENTS ACCORDING TO THE ENGINEERING PLANS AND SPECIFICATIONS.

7. THE CONTRACTOR SHALL LOCATE ALL UTILITIES OR UNDERGROUND STRUCTURES PRIOR TO CONSTRUCTION AND NOTIFY EACH RESPECTIVE UTILITY OWNER FORTY-EIGHT (48) HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION. CONTACT O.U.P.S. AT 1-800-362-2764.

8. IF A DISCREPANCY EXISTS BETWEEN THE PLANS AND SPECIFICATIONS, THE OWNER AND OWNER'S ENGINEER SHALL BE NOTIFIED BEFORE WORK IS COMMENCED.

9. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO EXERCISE SAFETY PRECAUTIONS AND TO PROVIDE ALL SAFETY EQUIPMENT TO SAFEGUARD WORKMEN AND ALL PERSONS ON OR NEAR THE WORK SITE.

10. THE CONTRACTOR SHALL EXAMINE THE WORK SITE AND SHALL SATISFY HIMSELF AS TO THE CHARACTER, QUALITY AND QUANTITIES OF WORK TO BE PERFORMED.

11. HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING FEATURES WITHIN THIS SITE IS PER PROVIDED SURVEY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE LOCATION OF EXISTING FEATURES SHOWN ON PLANS, SUCH AS GAS & ELECTRIC LINES, WATER LINES AND FIELD TILE, TO PROPERLY EXECUTE THE WORK OF HIS CONTRACT. IT SHALL FURTHER BE THE RESPONSIBILITY OF THE CONTRACTOR TO EXERCISE DUE CAUTION AROUND EXISTING COMPLETED WORK ON THE SITE.

12. THE CONTRACTOR SHALL REPAIR OR REPLACE ANY AND ALL EXISTING WORK DAMAGED DURING OR DUE TO THE EXECUTION OF THIS CONTRACT AT HIS OWN EXPENSE. ALL SAID WORK IS TO BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE OWNER.

13. SITE CLEARING SHALL COMPLY WITH C.O.C. ITEM 201. REMOVAL OF EXISTING PIPE, PAVEMENT, STRUCTURES AND OTHER OBSTRUCTIONS SHALL COMPLY WITH C.O.C. ITEM 202.

14. NON-ORGANIC SITE SOILS ARE ACCEPTABLE AS USE FOR STRUCTURAL FILL PROVIDED THEY MEET ALL REQUIREMENTS OF C.O.C. ITEM 203. MOISTURE ADJUSTMENT MAY BE REQUIRED AND SHALL BE PREFORMED BY THE CONTRACTOR.

15. THE CONTRACTOR SHALL REFERENCE ALL IRON PINS AND MONUMENTS BEFORE EXCAVATING AT OR NEAR SAID IRON PINS OR MONUMENTS. IF ANY PINS OR MONUMENTS ARE DESTROYED OR DAMAGED BY THE CONTRACTOR, THEY SHALL BE REPLACED BY A PROFESSIONAL LICENSED SURVEYOR OF OHIO AT THE COMPLETION OF THE PROJECT OR AT THE DIRECTION OF THE ENGINEER AT NO EXPENSE TO THE OWNER. THE COST FOR THIS SHALL BE INCLUDED IN THE PRICE BID FOR VARIOUS ITEMS.

16. ALL QUESTIONS SHALL BE DIRECTED TO THE BERKSHIRE TOWNSHIP TYLER LANE AT (614) 371-4075.

17. A PER CONSTRUCTION VIDEO OF THE EXISTING CONDITIONS SHALL BE SUBMITTED BY THE CONTRACTOR PRIOR TO CONSTRUCTION TO VERIFY EXISTING CONDITIONS OF THE SITE AND THE DRIVES ENTERING THE SITE.

BACKFILLING FOR PUBLIC STORM SEWERS, CULVERTS AND UTILITIES

1. UTILITY TRENCHES OUTSIDE THE RIGHT-OF-WAY SHALL BE BACKFILLED WITH SOILS MEETING THE REQUIREMENTS OF ITEM 203 (100 PCF OR GREATER). THESE TRENCHES ARE TO BE COMPACTED IN ACCORDANCE TO STANDARD DRAWING DCED R-100 AT +/- 2% OF OPTIMUM MOISTURE.

2. ALL UTILITY TRENCHES IN THE RIGHT-OF-WAY RUNNING PARALLEL TO THE EDGE PAVEMENT AND NOT OVER FIVE FEET (5') IN DEPTH SHALL BE BACKFILLED ACCORDING TO STANDARD DRAWING DCED R-100.

3. ALL UTILITY TRENCHES UNDER ROAD PAVEMENT WITHIN THE R-O-W, STARTING AT A DISTANCE OF FIVE FEET (5') FROM THE EDGE OF THE PAVEMENT AND EXTENDING ONE FOOT (1') IN DISTANCE FOR EACH ONE FOOT (1') IN DEPTH SHALL BE BACKFILLED WITH COMPACTED GRANULAR MATERIALS PER STANDARD DRAWING DCED R-100 OR LOW STRENGTH MORTAR BACKFILL. ALSO, THE TOP OF ALL UTILITY CONDUITS SHALL BE LOCATED AT LEAST ONE FOOT BELOW THE UNDERDRAINS.

4. ALL UTILITY TRENCHES OVER FIVE FEET (5') IN DEPTH, WITHIN THE R-O-W, WHICH RUN PARALLEL TO THE EDGE OF PAVEMENT OR THAT ARE IN THE ZONE OF INFLUENCE SHALL BE BACKFILLED AS PER STANDARD DRAWING DCED R-100.

5. THE CONTRACTOR SHALL INCLUDE IN THE UNIT PRICE BID FOR UNDERGROUND UTILITY PIPE, ALL TRENCHING, BACKFILLING AS PER PLAN, AND THE REMOVAL AND DISPOSAL OF BRUSH, TREES, STUMPS, ETC. WITHIN THE AREA OF EXCAVATION OF THE TRENCH.

6. THE CONTRACTOR SHALL REFER TO THE UTILITY PLAN AND PROFILE SHEETS TO DETERMINE CRITICAL UTILITY CROSSINGS. LOCATION OF FEATURES ASSOCIATED WITH CROSSING IS RESPONSIBILITY OF CONTRACTOR.

7. IN PAVEMENT, SIDEWALK, AND UTILITY CROSSING AREAS THE BACKFILL SHALL BE COMPACTED GRANULAR MATERIAL PER C.O.C. ITEM 304, AND ALL OTHER REMAINING AREAS SHALL BE BACKFILLED PER C.O.C. ITEM 603.08.

8. CASING PIPE REQUIRED WITHIN THE RIGHT-OF-WAY SHALL BE SDR 21 OR SCHEDULE 40 FOR NON-PRESSURIZED LINES AND C-900 (LESS THAN 12-INCHES) OR C-905 (GREATER THAN 12-INCHES) FOR PRESSURIZED LINES.

STORM SEWERS

1. THE CONTRACTOR SHALL INCLUDE IN THE UNIT PRICE BID FOR ITEM 603, ALL TRENCHING, EXCAVATION AND BACKFILLING PER STANDARD DRAWING DCED R-100, AND THE REMOVAL AND DISPOSAL OF BRUSH, TREES, STUMPS ETC. WITHIN THE AREA OF EXCAVATION OF THE TRENCH, UNLESS BID IN ITEM 203.

2. THE PROPOSED ELEVATIONS AND LOCATIONS OF INLETS, CATCH BASINS, AND PIPES, AND THE ESTIMATED LENGTHS OF PIPES, MAY BE ADJUSTED BY THE ENGINEER DURING THE ENTIRE IMPROVEMENT OF THIS PROJECT. BASIS OF PAYMENT FOR POSSIBLE ADJUSTMENTS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR VARIOUS STORM SEWERS TO BE ADJUSTED.

3. UNLESS OTHERWISE NOTED ON THE PLANS, ALL STORM SEWERS SHALL BE AS HEREAFTER SPECIFIED:
   a. ALL SIZES OF STORM SEWER LOCATED WITHIN THE RIGHT-OF-WAY SHALL BE TYPES "A" OR "B" CONDUIT (C.O.C. 706.02 OR C.O.C. 706.04).

   b. STORM SEWERS LOCATED OUTSIDE OF THE RIGHT-OF-WAY SHALL BE TYPE "C" CONDUIT (C.O.C. 706.02) OR POLYPROPYLENE COMPLYING WITH C.O.C. 720.13 OR 720.14. WHERE PLASTIC PIPE IS USED ON ANY PORTION OF STORM SYSTEM TO BE PLACED ON DRAINAGE MAINTENANCE, INSTALLATION OF THE STORM SEWER SHALL MEET THE REQUIREMENTS OF ARTICLE IX AND THE SUPPLEMENTAL SPECIFICATIONS INCLUDING THE MANDRELLING REQUIREMENTS.

4. ALL TYPE "A", "B", AND "C" CONDUIT SHALL HAVE JOINTS, PER CITY OF COLUMBUS 901.15 AND SHALL USE TYPE C BITUMINOUS PIPE JOINT FILLER.

5. BEDDING SHALL BE PROVIDED FOR ALL TYPE "A", "B", AND "C" CONDUIT PER DELAWARE COUNTY STANDARD DRAWINGS DCED S-149, DCED S-151, DCED S-152, DCED S-153 AND DCED S-155. GRANULAR BEDDING SHALL BE LIMITED TO CLEAN #8 OR #57 STONE AGGREGATE.

6. OPENINGS SHALL BE PROVIDED IN THE DRAINAGE STRUCTURES TO ACCOMMODATE UNDERDRAIN OUTLETS. ANY CORING NECESSARY SHALL BE INCLUDED WITHIN THE COST OF THE UNDERDRAIN. UNDERDRAINS TO BE CONSTRUCTED IN ACCORDANCE WITH THE PLAN SPECIFICATIONS.

GRADING NOTES:

1. EXCAVATION AND EMBANKMENT SHALL COMPLY WITH C.O.C. ITEM 203 AND DELAWARE COUNTY SUPPLEMENTAL SPECIFICATIONS.

2. EXCAVATION AND EMBANKMENT QUANTITIES DO NOT INCLUDE ANY PROVISION FOR UNDERCUTTING, FOOTINGS, OR UNSUITABLE MATERIAL.

3. AFTER THE TOPSOIL IS REMOVED, PROOFROLL THE PAVED AREAS SUBGRADES TO BE FILLED. SOFT AREAS ARE TO BE UNDERCUT AND STABILIZED PRIOR TO FILLING OPERATIONS. RELATIVE DEPTH OF UNDERCUT WILL BE DETERMINED WHEN SOFT AREAS ARE DISCOVERED. A THIRD PARTY GEOTECHNICAL SHALL DETERMINE THE DEPTH AND EXTENT OF THE UNDERCUT. GEOTECHNICAL ENGINEER TO BE PROVIDED BY OWNER.

EROSION AND SEDIMENTATION CONTROL NOTES

1. SILTATION AND EROSION SHALL BE CONTROLLED BY MINIMIZING THE TIME THE SITE IS DENUDED BY TEMPORARY SEEDING, PERMANENT SEEDING, AND THE USE OF VARIOUS EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMP's). THESE DEVICES ARE TO BE MAINTAINED THROUGHOUT THE CONSTRUCTION PHASE OF THIS PROJECT. ONCE THE SITE AREA HAS BEEN STABILIZED, BEST MANAGEMENT PRACTICES SHALL BE REMOVED WITH THE APPROVAL OF BERKSHIRE TOWNSHIP.

2. THE TEMPORARY CONSTRUCTION ENTRANCES SHALL BE MAINTAINED IN A STATE THAT SHALL PREVENT TRACKING OR FLOW OF MUD ONTO AREAS OUTSIDE CONSTRUCTION LIMITS. THIS WILL BE ACCOMPLISHED BY USE OF A GRAVEL CONSTRUCTION ENTRANCE AND THE REPAIR AND/OR CLEANOUT OF ANY DEVICES USED TO TRAP THE SEDIMENT. ANY MATERIALS SPILLED, DROPPED, OR TRACKED FROM THE CONSTRUCTION SITE ONTO THE ROADWAYS OR INTO THE STORM SYSTEM MUST BE REMOVED IMMEDIATELY.

3. THE CONTRACTOR SHALL PLACE INLET PROTECTION FOR SEDIMENT CONTROL AT CATCH BASINS IMMEDIATELY AFTER THEIR CONSTRUCTION. COST FOR THIS WORK SHALL BE INCLUDED UNDER EROSION CONTROL. THE CONTRACTOR SHALL REMOVE INLET PROTECTION WHEN GRASS ESTABLISHMENT REACHES A MINIMUM OF 70% GROWTH DENSITY OVER THE ENTIRE DRAINAGE AREA FLOWING TO CATCH BASINS. THE COUNTY ENGINEER SHALL DIRECT SEDIMENT CONTROL AT ALL CATCH BASINS IF REQUIRED.

4. TOPSOIL SHALL BE REMOVED FROM PROPOSED PAVED AREAS, MOUNDING AND EMBANKMENT AREAS PRIOR TO CONSTRUCTION OF PAVEMENT, MOUNDING, AND EMBANKMENT AREA. TOPSOIL SHALL BE STOCKPILED FOR RESPREADING. RESPREAD OF DISTURBED AREAS AND MOUND SHALL BE PART OF THIS CONTRACT.

5. THE CONTRACTOR SHALL NOT DISTURB AREAS OUTSIDE CONSTRUCTION LIMITS UNLESS AUTHORIZED BY THE PROPERTY OWNER.

6. THE CONTRACTOR SHALL DISPOSE OF EXCESS MATERIAL ONSITE.

7. CLOSE ATTENTION SHALL BE PAID TO THE PROPER INSTALLATION AND REPAIR OF PERIMETER CONTROLS TO PREVENT FAILURE.

8. NECESSARY REPAIRS TO BARRIERS OR REPLACEMENT OF PERIMETER CONTROLS SHALL BE ACCOMPLISHED PROMPTLY.

9. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE PERIMETER CONTROLS IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING & PROPOSED GRADE, PREPARED AND SEEDED.

10. ADDITIONAL EROSION AND SEDIMENT CONTROL BMP's SHALL BE INSTALLED AS DIRECTED BY BERKSHIRE TOWNSHIP.

11. THE CONTRUCTION ENTRANCE, SEDIMENT BASINS (TEMPORARY AND/OR PERMANENT), AND PERIMETER CONTROLS SHALL BE INSTALLED AS THE FIRST STEP OF THE CONSTRUCTION SEQUENCE.

12. NO SITE WORK SHALL COMMENCE UNTIL THE EROSION AND SEDIMENT CONTROLS ARE APPROVED BY BERKSHIRE TOWNSHIP.

13. CONTRACTOR SHALL REMOVE ANY SEDIMENT/DEBRIS FROM STORM SEWER SYSTEM PRIOR TO COMPLETION.

SITE CLEANUP

1. DURING CONSTRUCTION AND PRIOR TO ACCEPTANCE OF ANY IMPROVEMENTS, THE CONTRACTOR SHALL REMOVE OR CAUSE TO BE REMOVED ALL REFUSE, RUBBISH, UNUSED MATERIALS, EXCESS EARTH, FILL, ROCK, DEBRIS, AND FOREIGN MATTER FROM ALL AREAS WHERE DIRT IS STOCKPILED WITHIN THE WORK LIMITS. SUCH REMOVAL SHALL TAKE PLACE WITHIN TWENTY-FOUR (24) HOURS AFTER BEING NOTIFIED BY BERKSHIRE TOWNSHIP THAT SUCH WORK IS REQUIRED, AND SHALL BE COMPLETED TO THE SATISFACTION OF BERKSHIRE TOWNSHIP.

2. THIS WORK SHALL BE PERFORMED IN A MANNER WHICH PREVENTS EROSION AS WELL AS PREVENTS STORM WATER FROM ACCUMULATING OR PONDING ON THE SITE. THE WORK SHALL ALSO BE PERFORMED IN A MANNER THAT PREVENTS DISRUPTING OR IMPEDING SURFACE DRAINGE FROM ONSITE OR OFFSITE SOURCES AND PREVENTS ANY NEGATIVE EFFECTS ON ADJACENT PROPERTIES. A SIX-INCH OVERLAY OF TOPSOIL SHALL BE PROVIDED AND SHALL BE SEEDED PER DELAWARE COUNTY STANDARDS.

SEEDING

1. BASED ON CONSTRUCTION START-UP DATE AND CONTRACTOR'S SCHEDULE OF EVENTS, THE SEEDING MIXTURE AND SEDIMENT CONTROL MAY BE CHANGED TO COMPLY WITH BERKSHIRE TOWNSHIP STANDARDS AND SUPPLEMENTAL SPECIFICATIONS, DUE TO A NON- GROWING SEASON AT THE TIME OF START-UP.

2. THE CONTRACTOR SHALL APPLY TEMPORARY AND PERMANENT SEEDING, FERTILIZER, AND MULCHING TO THE SATISFACTION OF BERKSHIRE TOWNSHIP.

3. ALL SEEDING AND MULCHING SHALL BE BASED ON BERKSHIRE TOWNSHIP STANDARDS AND SUPPLEMENTAL SPECIFICATIONS.

ESTIMATE OF QUANTITIES

ITEM	QUANTITY	UNIT	DESCRIPTION
			DEMOLITION
201	LUMP	SUM	CLEARING & GRUBBING
			EARTHWORK
203	2354	CY	EXCAVATION, INCLUDING EMBANKMENT
203	LUMP	SUM	WATER, DUST CONTROL
204	2586	SY	SUBGRADE COMPACTION
			EROSION CONTROL
207	244	LF	PERIMETER FILTER FABRIC FENCE
207	4	EA	VERTIPRO INLET PROTECTION APPLIANCE
207	1	EA	CONSTRUCTION ENTRANCE
207	1	EA	CONCRETE WASHOUT AREA
207	1	EA	VEHICLE FUEL AREA
659	1,975	SY	PERMANENT SEEDING AND MULCHING
671	445	SY	JUTE MATTING
			COURT SECTION
448	101	CY	ASPHALT SURFACE COURSE, TYPE 1 (448), 100% LIME STONE TENNIS MIX FREE FROM/OF IRON DEPOSITS
448	134	CY	ASPHALT INTERMEDIATE COURSE, TYPE 2 (448)
304	402	CY	AGGREGATE BASE
SPEC	603	SF	STANDARD DUTY CONCRETE AT GRADE "SIDEWALK" W/6x6 MESH WIRE "REMOVE AND REPLACE"
SPEC	1,922	SF	STANDARD DUTY CONCRETE AT GRADE "SIDEWALK" W/6x6 MESH WIRE
			STORM SEWER
604	4	EA	2X2 CATCH BASIN, DCED-S133A
604	498	LF	4" PERFORATED W/FILTER SOCK PIPE
604	124	LF	6" PERFORATED W/FILTER SOCK PIPE
604	41	LF	8" PVC SD-35
604	97	LF	10" HDPE PIPE
604	582	LF	12" HDPE PIPE
SPEC	57	CY	GRANULAR BACKFILL
SPEC	2	EA	YARD DRAIN
			MISCELLANEOUS
SPEC	5	EA	GATES BLACK VINYL COATED, FUSE BOUNDED
SPEC	880	LF	10' FENCING BLACK VINYL COATED, FUSE BOUNDED
623	LUMP	SUM	CONSTRUCTION LAYOUT STAKES
624	LUMP	SUM	MOBILIZATION
SPEC	43,432	SF	2 COATS ACRYLIC RESURFACE COATING (21,716 PER COAT)
SPEC	43,432	SF	2 COATS ACRYLIC COLOR SURFACE COATING (21,716 PER COAT)
SPEC	1,612	LF	COURT STRIPING ALL COURTS – COMPLETE
SPEC	LUMP	SUM	JOB SITE SECURITY
SPEC	LUMP	SUM	AS-BUILT TOPO SURVEY FOR CONFIRMATION THAT 1/8" PER 10' STANDARD IS MET
SPEC	LUMP	SUM	BASKETBALL POSTS, NETS ALL APPURTENANCE, COMPLETE
SPEC	LUMP	SUM	TENNIS POSTS, NETS ALL APPURTENANCE, COMPLETE
SPEC	LUMP	SUM	PICKLE BALL POSTS, NETS ALL APPURTENANCE, COMPLETE

ESTIMATE OF QUANTITIES NOTES

QUANTITIES LISTED ABOVE ARE ESTIMATES AND SUBJECT TO REVISION DURING CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERITY ALL QUANTITIES PRIOR TO PREPARING & SUBMITTING THEIR BID.

ALL ITEMS OF WORK CALLED FOR ON THIS PLAN, FOR WHICH NO SPECIFIC METHOD OF PAYMENT IS INDICATED, SHALL BE PERFORMED BY THE CONTRACTOR AND THE COST OF SUCH WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE VARIOUS ITEMS.

BIDDING INSTRUCTIONS

1. THE COSTS FOR TEMPORARY SIGNAGE, TRASH REMOVAL, PORTABLE TOILETS, TEMPORARY ROADS, AND CONSTRUCTION CONTROL STAKING ARE TO BE INCLUDED IN THE BID.
2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SECURE SITE DURING THE CONSTRUCTION OF THE PROJECT WHILE MAINTAINING ACCESS TO THE EXISTING PAVILION.
3. CONTRACTOR TO INCLUDE COURT EQUIPMENT, FENCING AND SURFACING SUBMITTALS WITH THEIR BID PER THE BID DOCUMENTS. FINAL COURT COLOR COATING WILL BE DETERMINED BASED UPON SAMPLES SUBMITTED WITH LOWEST AND BEST BID.

REVISION

#	DESCRIPTION OF CHANGE	BY	DATE

CHANGE ORDER SCHEDULE

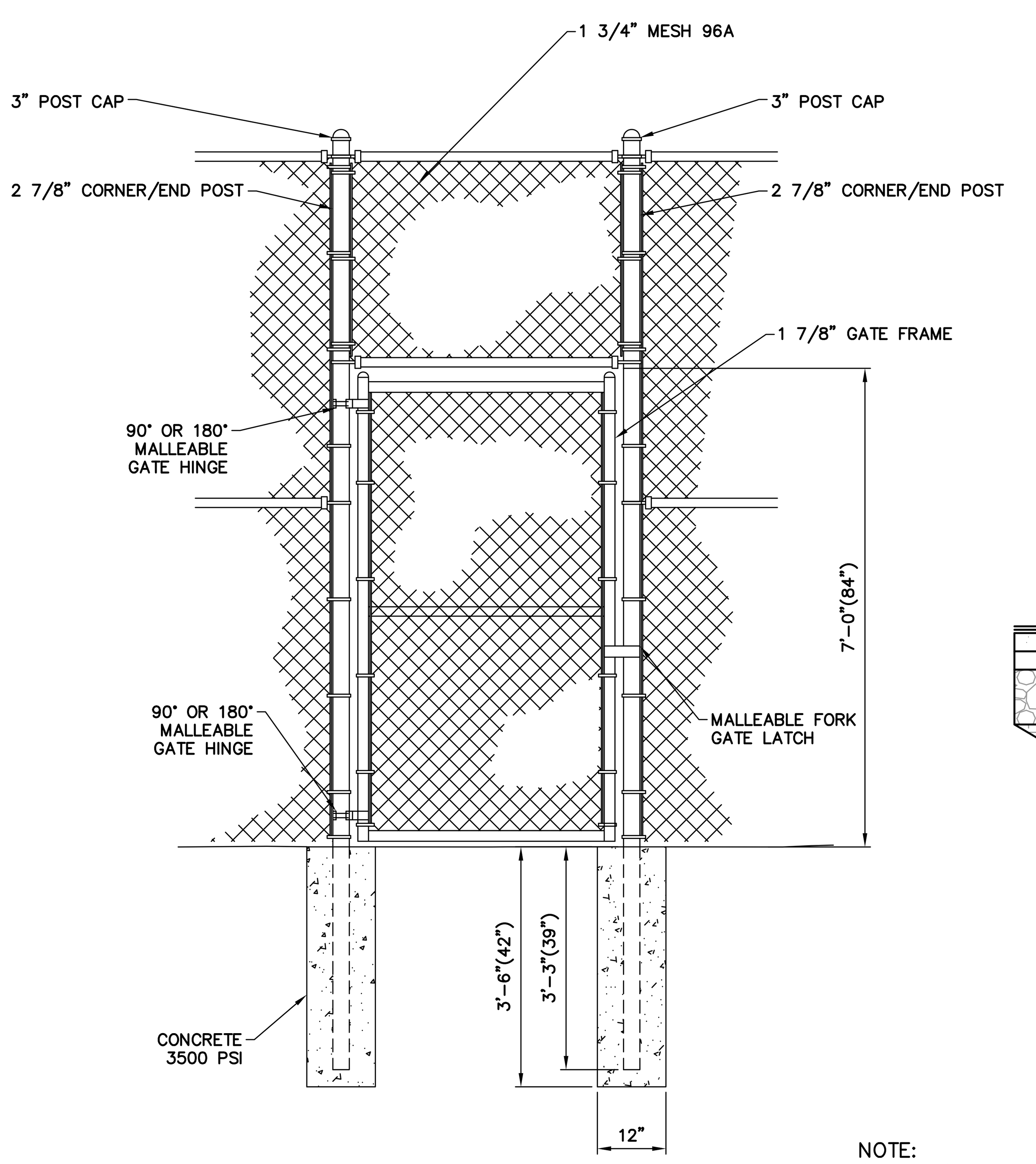
TerrainEvolution
Your bridge between Vision and Success
720 East Broad Street | Suite 203 | Columbus, OH 43215
P: 614.385.1090 | F: 614.385.1085 | E: info@terrainevolution.com

BERKSHIRE TOWNSHIP, DELAWARE COUNTY, OHIO
BERKSHIRE TOWNSHIP RECREATIONAL COURTS
1454 ROME CORNERS ROAD
GENERAL NOTES & QUANTITIES

DRAWING SET STATUS:
- ☐ PRELIMINARY ENGINEERING SET
- ☐ AGENCY REVIEW SET
- ■ CONSTRUCTION DOCUMENT SET
- ☐ AS-BUILT DOCUMENT SET

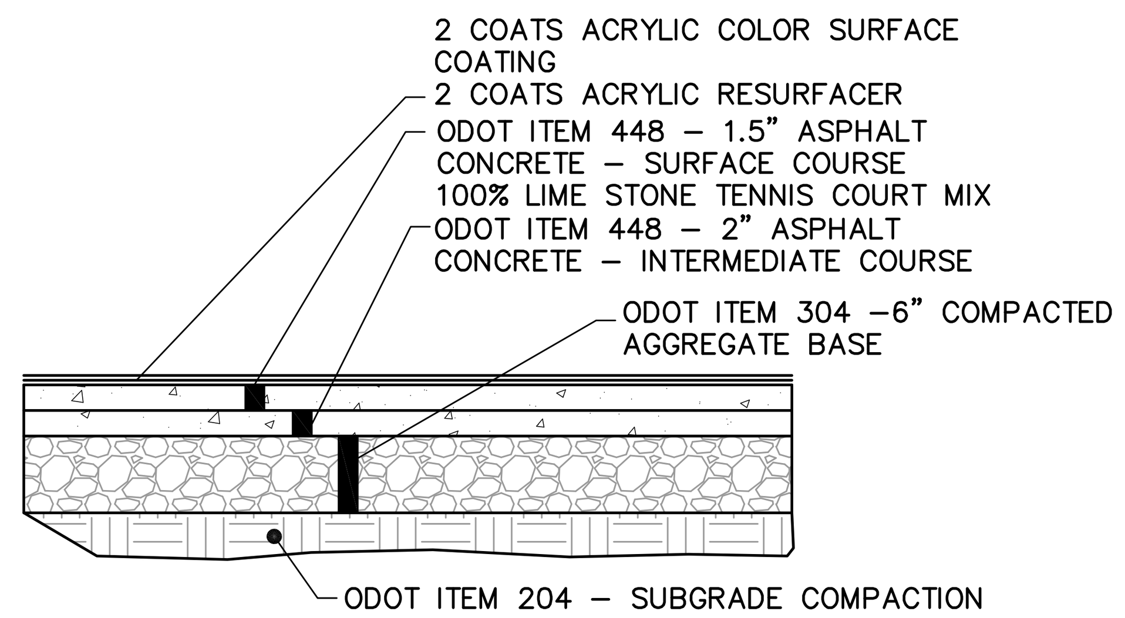
DESIGN	DRAFT	CHECK
DGR	DGR	MSW

PROJECT NO.: 25-002
DATE: MARCH, 2025
SCALE: HORIZONTAL: N/A VERTICAL: N/A



4' CHAIN LINK GATE DETAIL

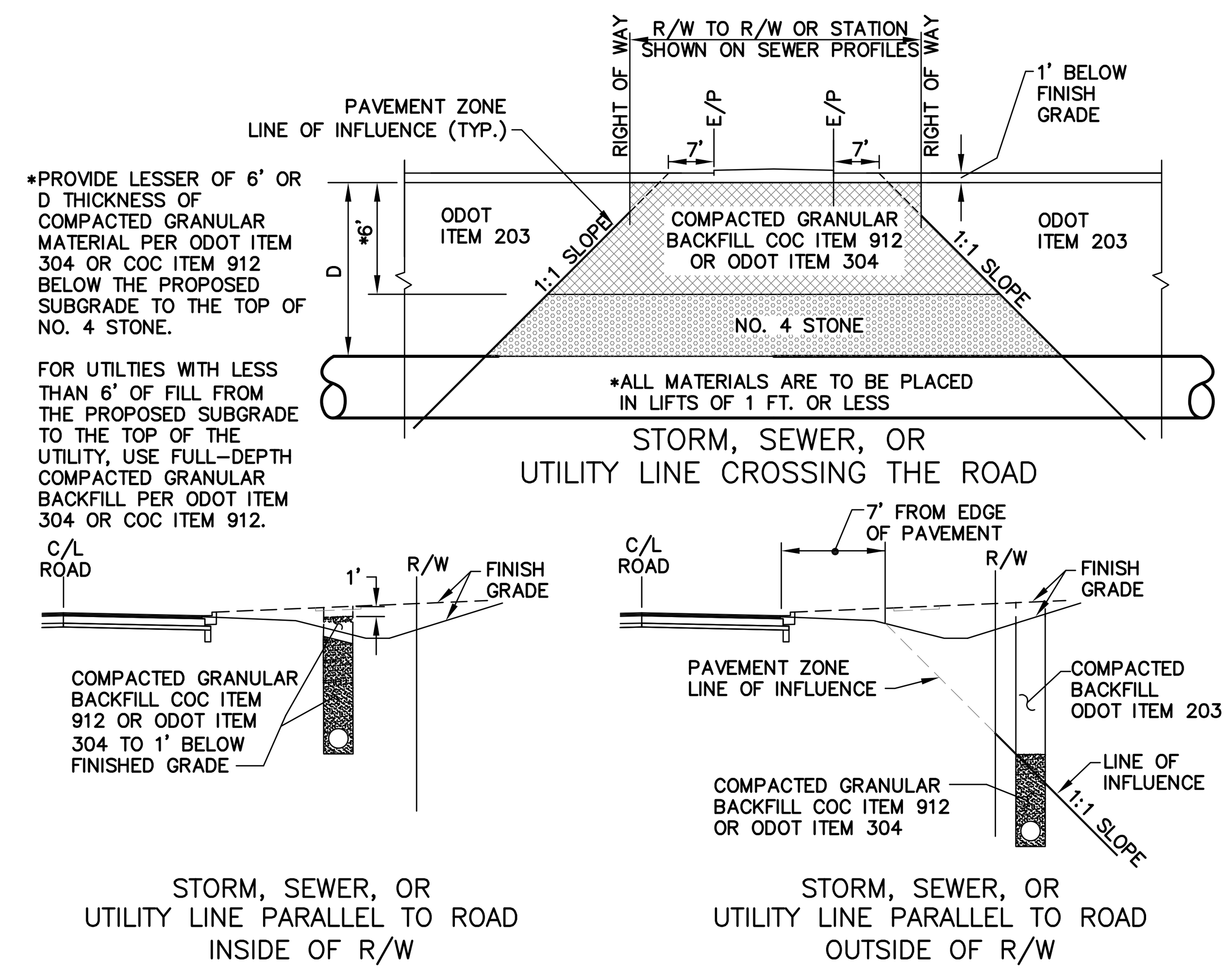
NOT TO SCALE



COURT SECTION

NOT TO SCALE

NOTE:
CONTRACTOR TO PROVIDE CHAIN LINK FENCE AND POSTS AS SPECIFIED IN BID DOCUMENTS. FENCE WILL BE FUSE BONDED BLACK VINYL COATED CHAIN LINK FENCE PER AMERICAN SPORT BUILDER ASSOCIATION. FENCE MESH MATERIAL TO BE BLACK ASTM F934 WITH COATING ADHESION PER ASTM F66B CLASS 2B. FENCE POST, RAILS AND OTHER FRAMEWORK TO BE CENTERED PER ASTM F-1043 TYPE B COATING.

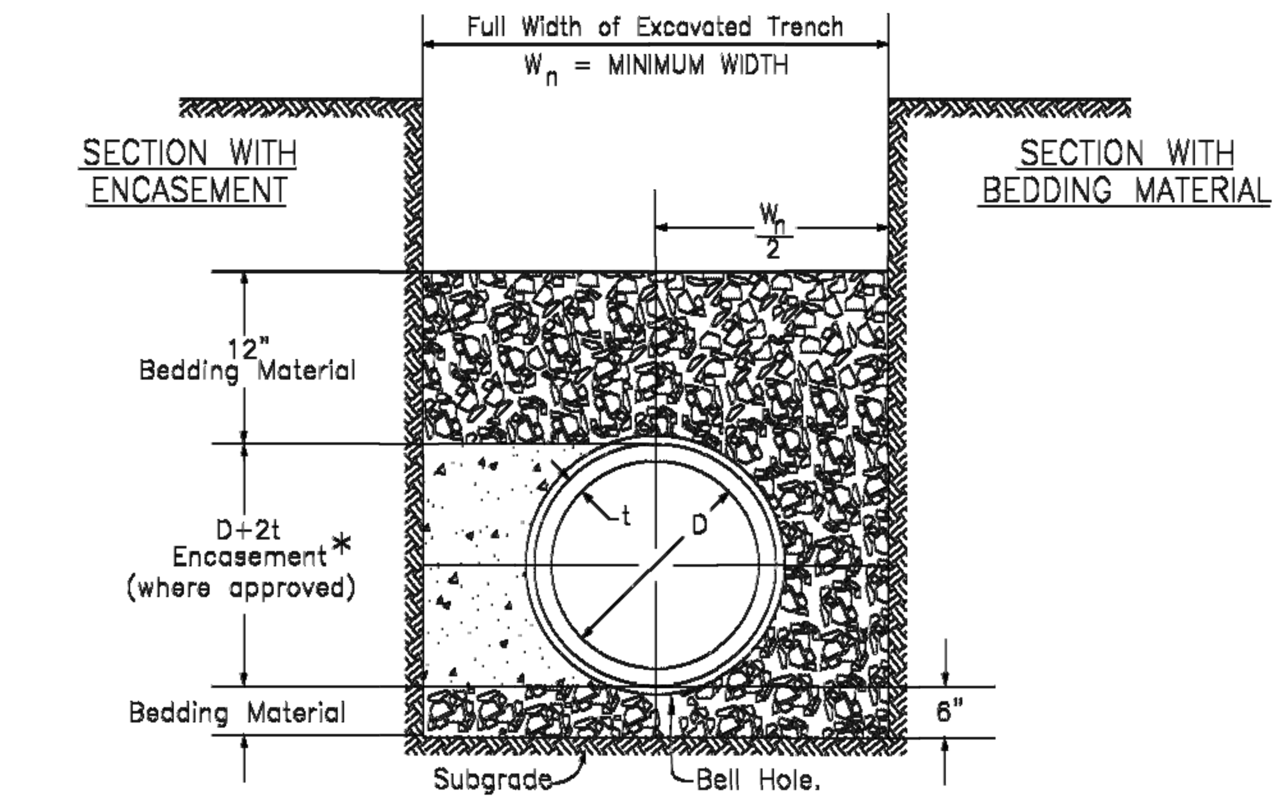


NOTES:
TRENCH WIDTHS 12" AND GREATER:
FOR TRENCH WIDTHS 12" OR GREATER, USE COMPACTED GRANULAR MATERIAL AS SHOWN IN THE DETAILS ABOVE.
TRENCH WIDTHS LESS THAN 12":
FOR TRENCH WIDTHS LESS THAN 12" LOCATED WITHIN THE R/W OR THE PAVEMENT'S ZONE OF INFLUENCE, AS SHOWN ABOVE, USE ODOT ITEM 613, LOW STRENGTH MORTAR BACKFILL, TYPE 2, OR COC ITEM 613, FLOWABLE CONTROLLED DENSITY FILL, TYPE II.

MINIMUM CASING PIPE REQUIREMENTS FOR UTILITIES WHEN REQUIRED:
1. PRESSURIZED 12" DIA. OR LESS = C900
2. PRESSURIZED GREATER THAN 12" DIA. = C905
3. NON-PRESSURIZED = SDR21 OR SCHEDULE 40

BACKFILL IN R/W DETAIL
DCED-R100

NOT TO SCALE



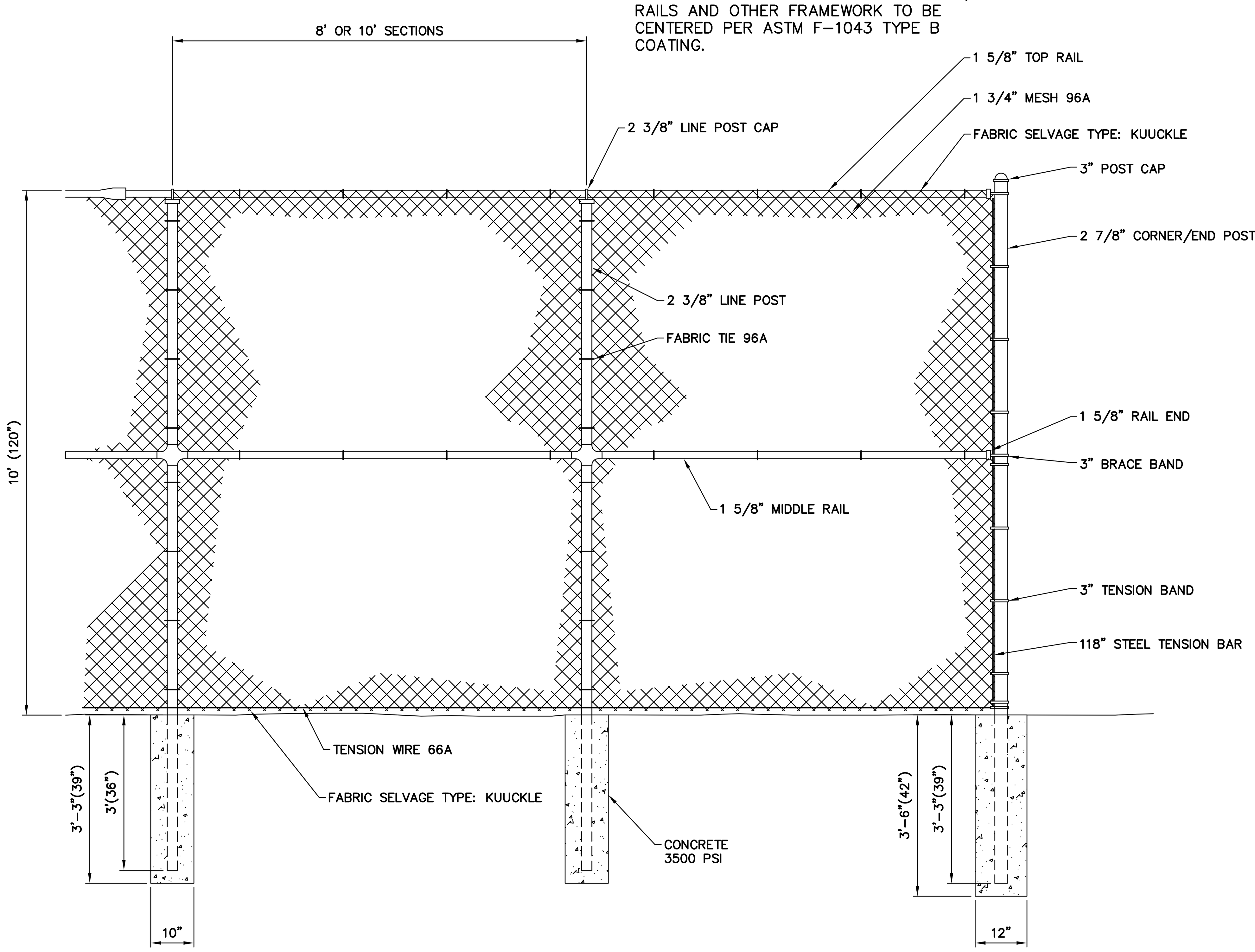
*Where Encasement has been approved for use by the County Engineer, the Encasement shall be Class "C" Concrete, Item 905.

NOTES
Section applies to storm sewers using flexible sewer pipe.
Sections Symmetrical about ℄.
Dimensions are expressed in inches.

D*	W_n*	D*	W_n*
12	36	30	60
15	36	36	72
18	48	42	72
21	48	48	96
24	48	60	108
27	60		

*Inches

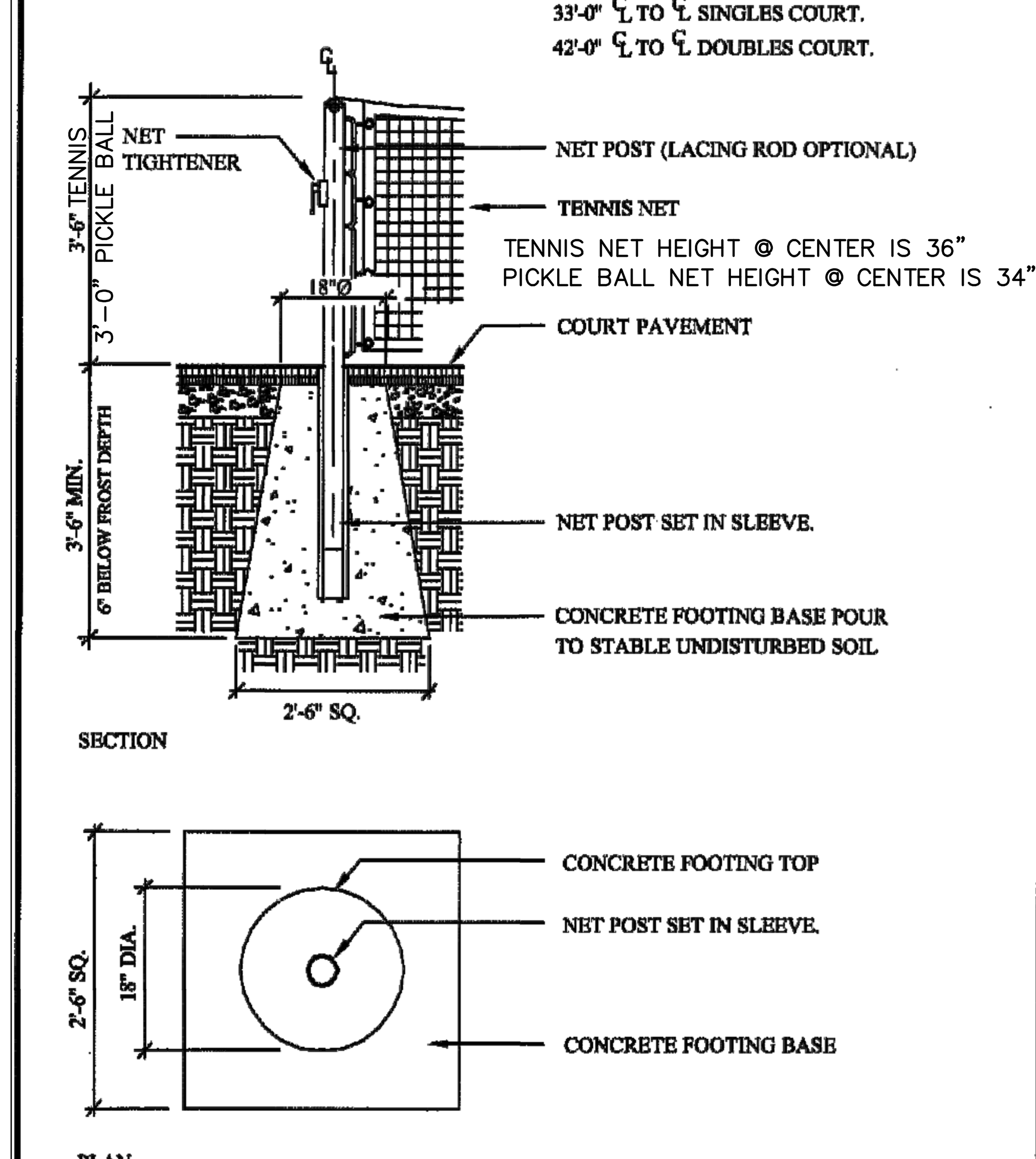
CHRIS E. BAUSERMAN, P.E., P.S. Delaware County Engineer	STANDARD CONSTRUCTION DRAWING	DELAWARE COUNTY ENGINEER'S OFFICE 50 Channing Street Delaware, Ohio 43015 PHONE: (740)833-2400 FAX: (740)833-2399 www.co.delaware.oh.us
Delaware County Engineer APPROVED 1-22-2008 REVISED 1-04-2010	TYPE 1 BEDDING FOR FLEXIBLE SEWER PIPE 12"-60" DIA. ITEM 901	Drawn KS Checked EM sheet 1 of 1 FILE NO. DCED-S149



10' CHAIN LINK FENCE DETAIL

NOT TO SCALE

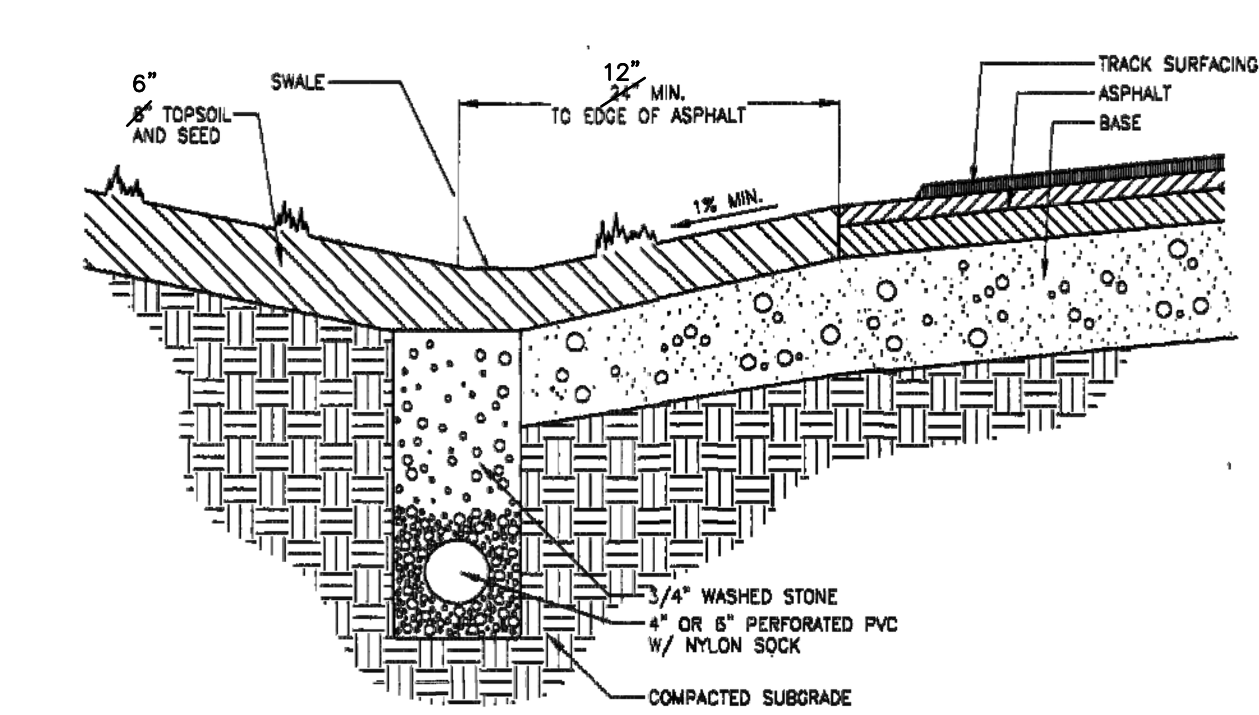
NET POST LOCATIONS:
33'-0" ℄ TO ℄ SINGLES COURT.
42'-0" ℄ TO ℄ DOUBLES COURT.



PICKLEBALL/ TENNIS NET POST FOOTING

NOT TO SCALE

PERIMETER TRENCH / FRENCH DRAIN
FIGURE 2-10



#	DESCRIPTION OF CHANGE	BY	DATE

CHANGE ORDER SCHEDULE / REVISION

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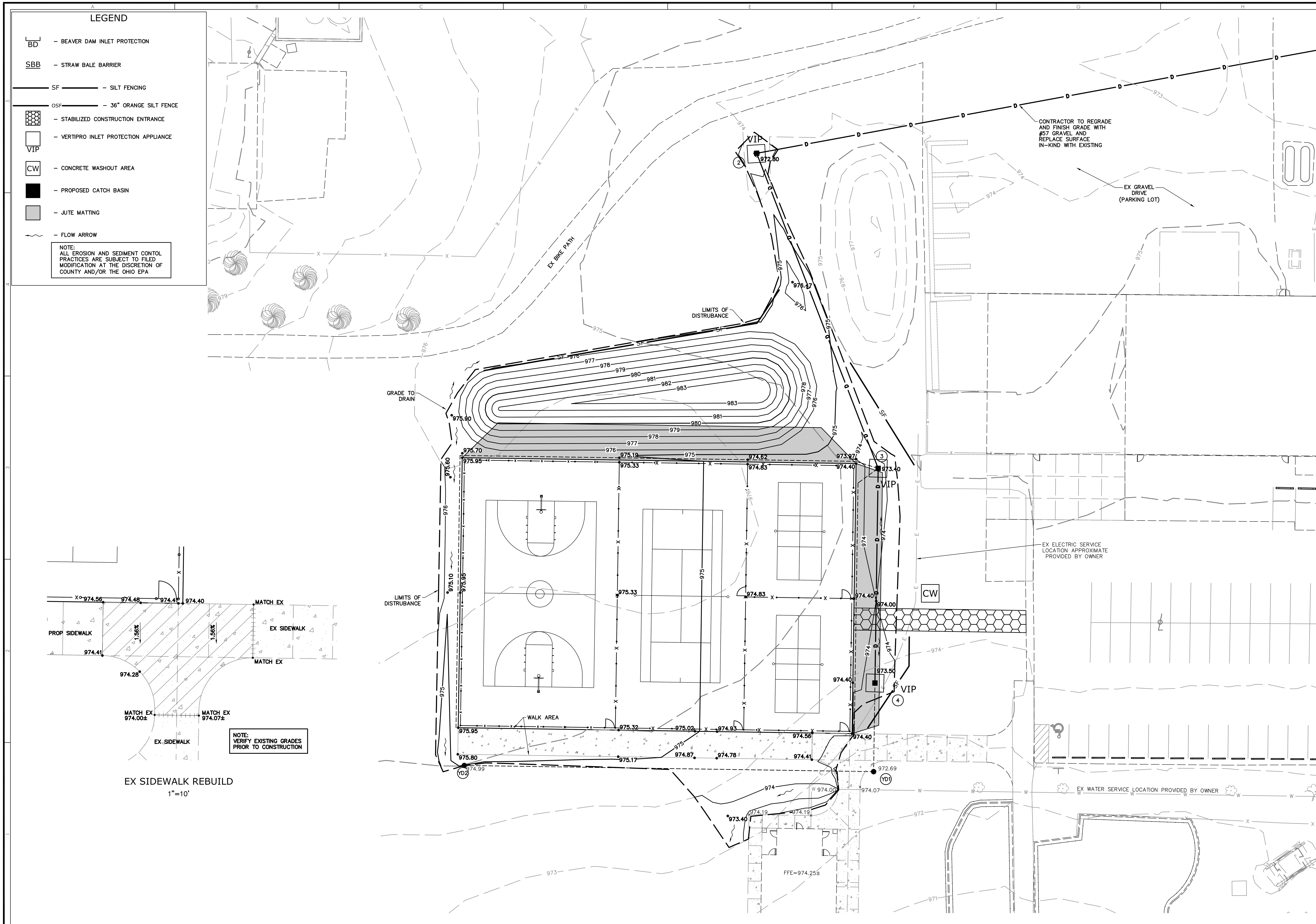
BERKSHIRE TOWNSHIP, DELAWARE COUNTY, OHIO
BERKSHIRE TOWNSHIP RECREATIONAL COURTS
1454 ROME CORNERS ROAD

DETAILS

DRAWING SET STATUS:
- ☐ PRELIMINARY ENGINEERING SET
- ☐ AGENCY REVIEW SET
- ■ CONSTRUCTION DOCUMENT SET
- ☐ AS-BUILT DOCUMENT SET

DESIGN	DRAFT	CHECK
DGR	DGR	MSW

PROJECT NO.: 25-002
DATE: MARCH, 2025
SCALE: HORIZONTAL: N/A VERTICAL: N/A



CHANGE ORDER SCHEDULE

#	DESCRIPTION OF CHANGE	REVISION BY	REVISION DATE

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BERKSHIRE TOWNSHIP, DELAWARE COUNTY, OHIO

BERKSHIRE TOWNSHIP RECREATIONAL COURTS

1454 ROME CORNERS ROAD

GRADING PLAN

DRAWING SET STATUS:
- ☐ PRELIMINARY ENGINEERING SET
- ☐ AGENCY REVIEW SET
- ■ CONSTRUCTION DOCUMENT SET
- ☐ AS-BUILT DOCUMENT SET

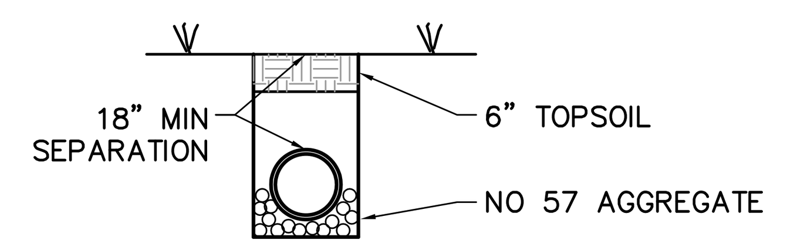
DESIGN	DRAFT	CHECK
DGR	DGR	MSW

PROJECT NO.: 25-002
DATE: MARCH, 2025
SCALE: HORIZONTAL: 1" = 20' VERTICAL: N/A

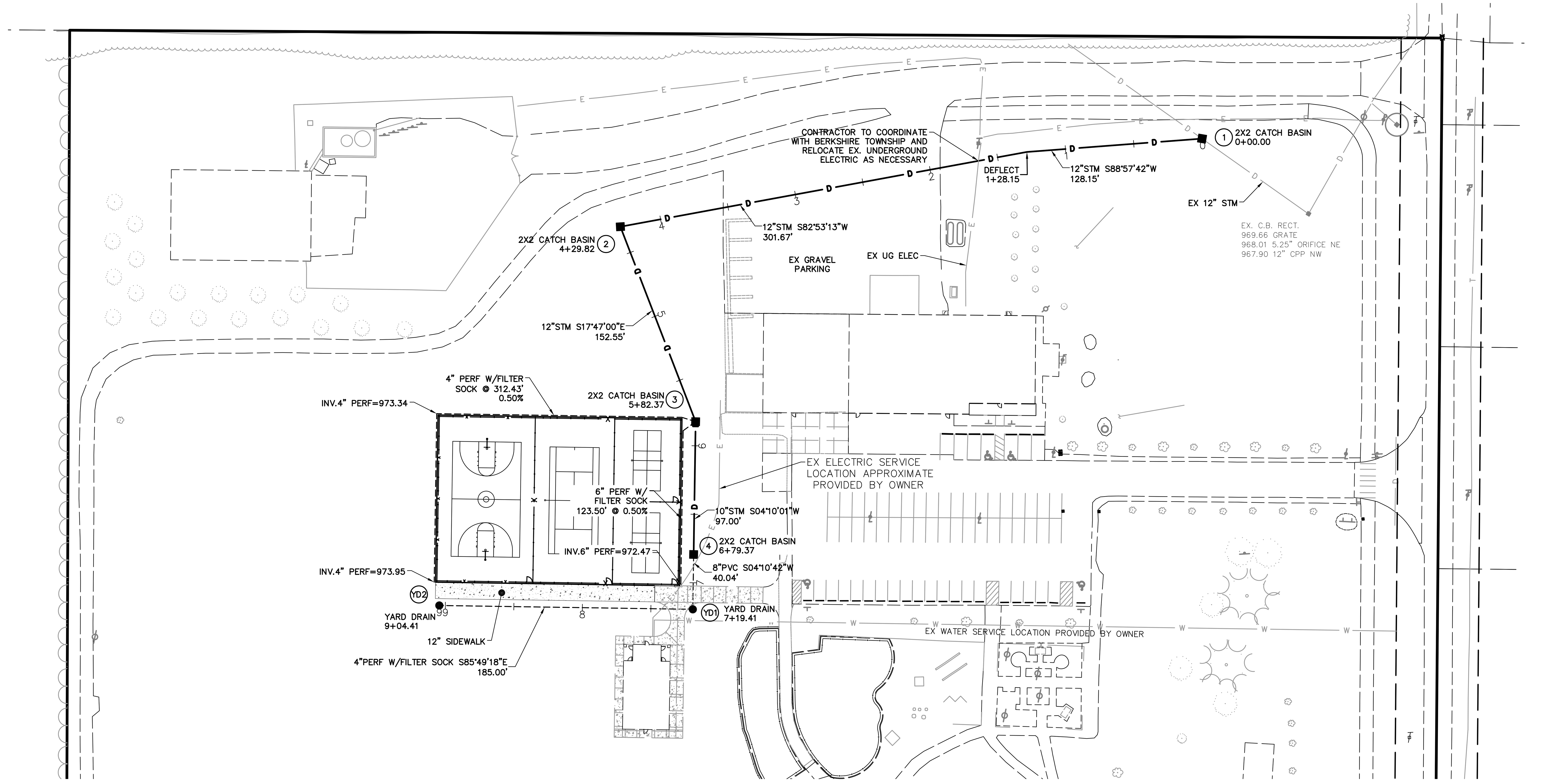
LEGEND

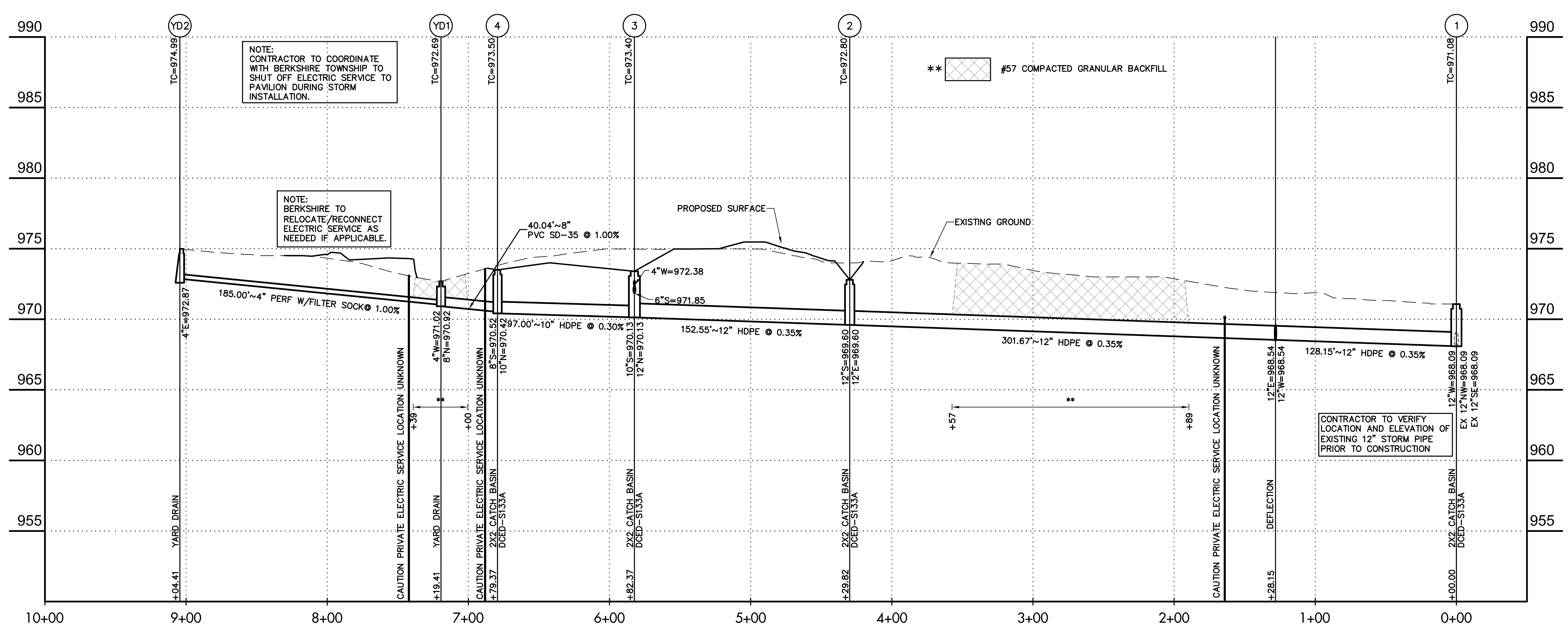
EXISTING:
- ELECTRIC
- STORM SEWER

PROPOSED:
- PREFORRATED W/SOCK UNDERDRAIN
- CATCH BASIN



UNDERDRAIN IN GRASS DETAIL
NOT TO SCALE





GRAPHIC SCALE

(IN FEET)
1 inch = 50 ft.

REVISION		
DATE	BY	CHANGE ORDER SCHEDULE DESCRIPTION OF CHANGE

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BERKSHIRE TOWNSHIP, DELAWARE COUNTY, OHIO

BERKSHIRE TOWNSHIP RECREATIONAL COURTS

1454 ROME CORNERS ROAD

UNDERDRAIN PLAN & PROFILE

DRAWING SET STATUS:
- ☐ PRELIMINARY ENGINEERING SET
- ☐ AGENCY REVIEW SET
- ■ CONSTRUCTION DOCUMENT SET
- ☐ AS-BUILT DOCUMENT SET

DESIGN	DRAFT	CHECK
DGR	DGR	MSW

PROJECT NO.: 25-002

DATE: MARCH, 2025

SCALE:
HORIZONTAL: 1" = 50'
VERTICAL: 1" = 5'

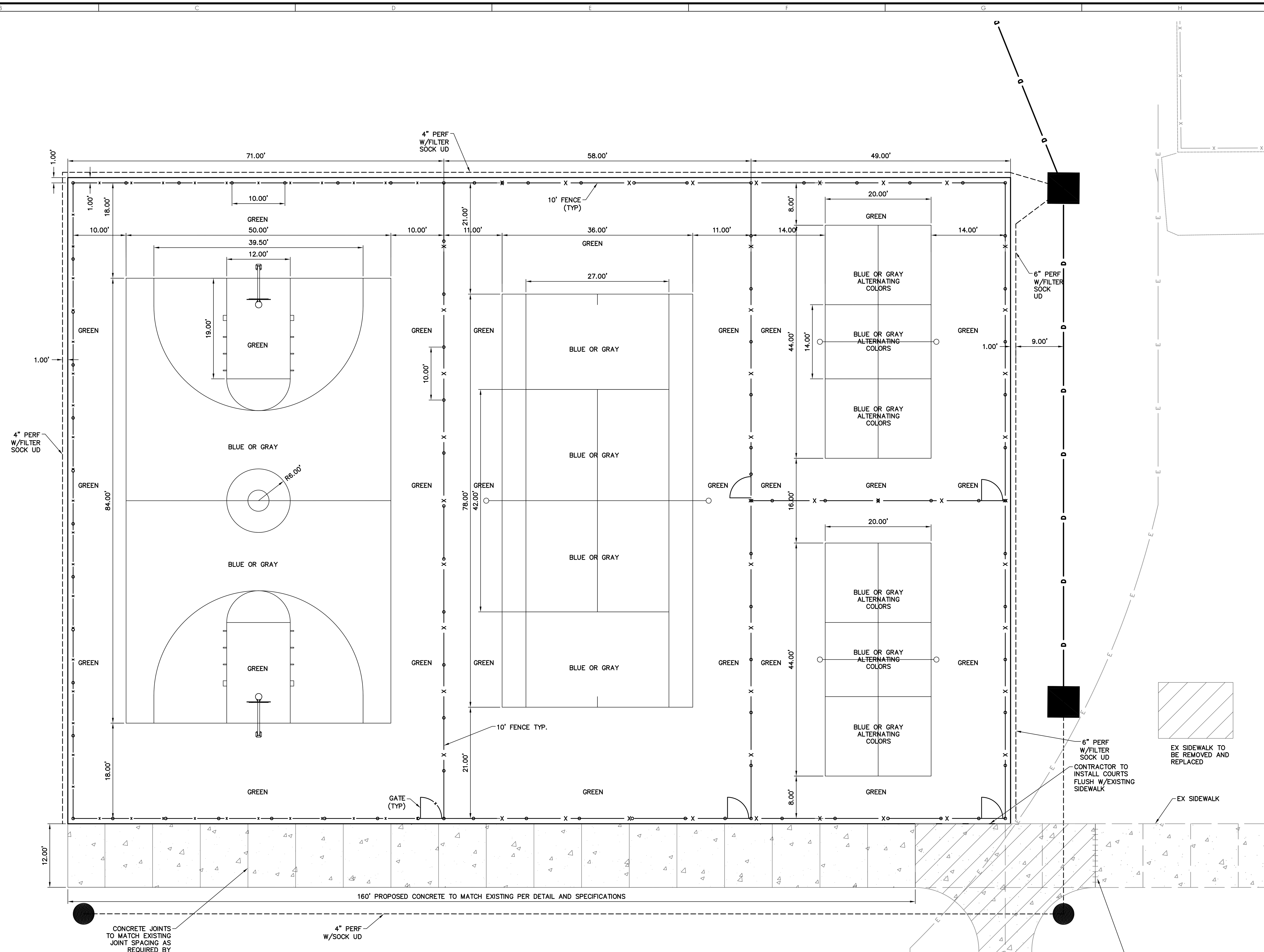
SHEET NO.: 5/10

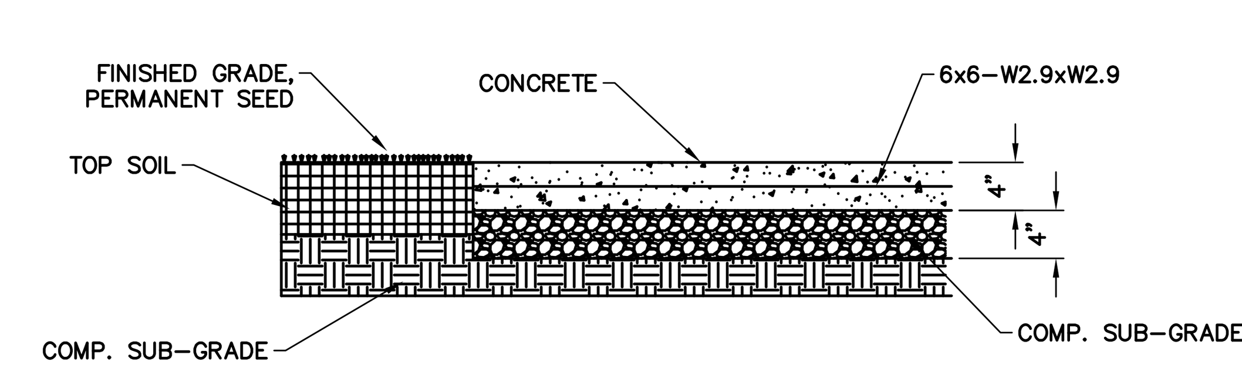
GENERAL NOTE:

1. CONTRACTOR TO PROVIDE CHAIN LINK FENCE AND POSTS AS SPECIFIED IN BID DOCUMENTS. FENCE WILL BE FUSE BONDED BLACK VINYL COATED CHAIN LINK FENCE PER AMERICAN SPORT BUILDER ASSOCIATION. FENCE MESH MATERIAL TO BE BLACK ASTM F934 WITH COATING ADHESION PER ASTM F66B CLASS 2B. FENCE POST, RAILS AND OTHER FRAMEWORK TO BE CENTERED PER ASTM F-1043 TYPE B COATING.
2. FENCE TO BE INSTALLED PER ASTM 567. IF PVC COATING IS DAMAGED DURING CONSTRUCTION, THE CONTRACTOR SHALL REPLACE OR REPAIR THE MATERIAL AT HIS OWN EXPENSE.
3. THERE SHALL BE NO DEVIATION IN PAVEMENT GRADE THAT IS GREATER THAN 1/8" PER 10 FEET PER AMERICAN SPORT BUILDERS ASSOCIATION SPECIFICATION. ANY DEVIATION GREATER THAN 1/8" PER 10 FEET, SHALL BE REPAIRED PRIOR TO ANY COURT COATING BEING APPLIED AT CONTRACTOR'S EXPENSE.
4. SURFACE COATING TO BE A PRODUCT FROM:
   - NOVA SPORTS
   - ADVANCE POLYMER TECHNOLOGIES
   - KELLEY TECHNICAL COATINGS
   - SPORTMASTER
   - OR APPROVED EQUAL
4. WIND BREAKS WILL NOT BE INSTALLED AS PART OF THIS PROJECT.
5. ALL STRIPING TO BE 2" WHITE ACRYLIC STRIPING PER AMERICAN SPORT BUILDER ASSOCIATION.
6. SURFACE ASPHALT TO BE 100% LIMESTONE TENNIS COURT MIX FREE OF IRON DEPOSITS.
7. FENCE POST CONCRETE TO BE BRUSH FINISHED, FLUSH WITH ASPHALT.
8. BASKETBALL POSTS, BACKBOARDS AND NETS, ETC. SHALL COME AS A SINGLE UNIT COMPLETE AND INSTALLED AND BE PER FORTIN IRON WORKS OR APPROVED EQUAL.
9. TENNIS AND PICKLEBALL POSTNETS ARE TO BE PER US TENNIS COURT AND TRACK BUILDERS ASSOCIATION.
10. CONTRACTOR TO REPAIR ANY DAMAGE TO EXISTING PAVEMENT, ASPHALT OR CONCRETE DURING CONSTRUCTION.
11. CONTRACTOR TO SUBMIT COLOR SAMPLES TO BERKSHIRE TOWNSHIP OF BLUE, GREEN, AND GRAY FOR FINAL COLOR SELECTION.

SURFACE COATING NOTE:

1. SPORTMASTER COLOR COATING SYSTEM OR APPROVED EQUAL OVER ASPHALT TENNIS COURT SURFACES.
2. THE FOLLOWING SPECIFICATIONS PERTAIN TO THE APPLICATION OF SPORTMASTER COLOR COATING SYSTEMS OR APPROVED EQUAL OVER ASPHALT TENNIS COURT SURFACES. REFER TO PRODUCT TECHNICAL DATA SHEETS FOR SPECIFIC MIXING AND APPLICATION INSTRUCTIONS. PROVIDED BY MANUFACTURE.
3. NEW ASPHALT SURFACES MUST CURE 30 DAYS PRIOR TO APPLICATION. THE SURFACE MUST BE CLEANED ENTIRELY OF DUST, DIRT, DEBRIS, AND ALL LOOSE MATERIALS.
4. FILL ALL CRACKS WITH SPORTMASTER CRACK MAGIC, ACRYLIC CRACK PATCH, OR OTHER SUITABLE CRACK FILLER.
5. LEVEL DEPRESSIONS OF "BIRD BATHS" (1/8" INCH OR DEEPER) WITH SPORTMASTER ACRYLIC PATCH OR APPROVED EQUAL BINDER OR ACRYLIC RESURFACER PATCHING MIX.
6. APPLY TWO COATS OF SPORTMASTER ACRYLIC RESURFACER OR EQUAL AS REQUIRED BY SURFACE ROUGHNESS AND POROSITY TO PROVIDE A SMOOTH UNDERLAYMENT FOR APPLICATION OF THE SPORTMASTER COLOR SYSTEM OR APPROVED EQUAL.
7. OVER PREPARED ASPHALT SURFACE APPLY A MINIMUM OF TWO COATS OF SPORTMASTER COLOR CONCENTRATE OR APPROVED EQUAL IN ACCORDANCE WITH MANUFACTURE'S MIXING AND APPLICATION INSTRUCTIONS.
8. LINE MARKINGS SHALL BE LAID OUT ACCORDING TO UNITED STATES TENNIS ASSOCIATION SPECIFICATIONS.
9. AFTER MASKING TAPE HAS BEEN LAID APPLY SPORTMASTER STRIPE RITE OR APPROVED EQUAL LINE PRIMER TO SEAL VOIDS BETWEEN MASKING TAPE AND COURT SURFACE TO PREVENT "BLEED UNDER" WHEN SPORTMASTER LINE PAINT OR APPROVED EQUAL IS APPLIED.
10. APPLY A MINIMUM OF ONE COAT OF SPORTMASTER LINE PAINT OR APPROVED EQUAL.
11. ALL WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER. ALL CONTAINERS AND DEBRIS SHALL BE REMOVED FROM JOB WHEN COMPLETED.





NOTE: PLACE 1/2" BIT. EXP. JT. @ MAXIMUM 30' O.C. IN SLAB

STANDARD DUTY CONCRETE AT GRADE
SCALE N/A

GRAPHIC SCALE
10 5 0 10
(IN FEET)
1 inch = 10 ft.

REVISION			
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BERKSHIRE TOWNSHIP, DELAWARE COUNTY, OHIO

BERKSHIRE TOWNSHIP RECREATIONAL COURTS

1454 ROME CORNERS ROAD

DIMENSION PLAN

DRAWING SET STATUS:
- ☐ PRELIMINARY ENGINEERING SET
- ☐ AGENCY REVIEW SET
- ■ CONSTRUCTION DOCUMENT SET
- ☐ AS-BUILT DOCUMENT SET

DESIGN	DRAFT	CHECK
DGR	DGR	MSW

PROJECT NO.: 25-002

DATE: MARCH, 2025

SCALE:
HORIZONTAL: 1" = 10'
VERTICAL: N/A

STORMWATER POLLUTION PREVENTION

GENERAL NOTES
UNLESS OTHERWISE NOTED, STANDARDS AND SPECIFICATION ESTABLISHED IN THE LATEST EDITION OF THE OHIO DEPARTMENT OF NATURAL RESOURCES, DIVISION OF SOIL & WATER CONSERVATION, MANUAL ENTITLED "RAINWATER & LAND DEVELOPMENT: OHIO'S STANDARDS FOR STORMWATER MANAGEMENT & DEVELOPMENT & URBAN STREAM PROTECTION" SHALL GOVERN THE STORMWATER POLLUTION PREVENTION AND EROSION & SEDIMENT CONTROL INSTALLATION, INSPECTION, & MAINTENANCE FOR THIS PROJECT.

THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR PROVIDING NECESSARY AND ADEQUATE MEASURES FOR PROPER CONTROL OF EROSION AND SEDIMENT RUNOFF FROM THE SITE ALONG WITH PROPER MAINTENANCE AND INSPECTION TO MAINTAIN COMPLIANCE WITH THE NPDES GENERAL PERMIT FOR STORM DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY. ADDITIONALLY, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THE CURRENT STORMWATER POLLUTION PREVENTION PLAN IMMEDIATELY AVAILABLE OR POSTED ON SITE.

PRIOR TO CONSTRUCTION OPERATIONS IN A PARTICULAR AREA, ALL SEDIMENTATION AND EROSION CONTROL FEATURES SHALL BE IN PLACE. FIELD ADJUSTMENTS WITH RESPECT TO LOCATIONS AND DIMENSIONS MAY BE MADE BY THE ENGINEER.

THE CONTRACTOR SHALL PLACE INLET PROTECTION FOR THE SEDIMENTATION CONTROL IMMEDIATELY AFTER CONSTRUCTION OF THE CATCH BASINS OR INLETS THAT ARE NOT TRIBUTARY TO A SEDIMENT BASIN OR DAM. INLET PROTECTION NOT REQUIRED FOR STORM SEWER DISCHARGING INTO A SEDIMENT BASIN OR LAKE PROVIDED STORM SEWERS ARE CLEANED AND BASINS/LAKES ARE DREDGED TO THE SATISFACTION OF THE GOVERNING JURISDICTIONAL AGENCIES PRIOR TO ACCEPTANCE.

IT MAY BECOME NECESSARY TO REMOVE PORTIONS OF SEDIMENTATION CONTROLS DURING CONSTRUCTION TO FACILITATE THE GRADING OPERATIONS IN CERTAIN AREAS. HOWEVER, THE CONTROLS SHALL BE REPLACED UPON GRADING OR DURING ANY INCLEMENT WEATHER.

COMPACTED SOIL IS REQUIRED AT ALL CATCH BASINS TO PREVENT PIPING. IF PIPING AROUND STRUCTURES IS OBSERVED THE STRUCTURE WILL BE REQUIRED TO BE UNEARTHED AND CORRECTIVE MEASURES TAKEN.

THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT NO SOLID OR LIQUID WASTE IS DISCHARGED INTO STORM WATER RUNOFF. UNTREATED SEDIMENT-LADEN RUNOFF SHALL NOT FLOW OFF OF SITE WITHOUT BEING DIRECTED THROUGH A CONTROL PRACTICE. CONCRETE TRUCKS WILL NOT BE ALLOWED TO WASH OUT OR DISCHARGE SURPLUS CONCRETE INTO OR ALONGSIDE RIVERS, STREAMS, OR CREEKS OR INTO NATURAL OR MANMADE CHANNELS OR SWALES LEADING THERETO.

CONCRETE WASH WATER AND SURPLUS CONCRETE SHALL BE CONFINED TO APPROVED AREAS; AFTER SOLIDIFYING, THESE WASTE MATERIALS SHALL BE REMOVED FROM THE SITE.

THE COST FOR TEMPORARY CHANNELS, SEDIMENT DAMS, SEDIMENT BASINS, AND OTHER APPURTENANT EARTH MOVING OPERATIONS SHALL BE INCLUDED IN THE PRICE BID FOR EROSION AND SEDIMENTATION CONTROL QUANTITIES.

THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT OFF-SITE TRACKING OF SEDIMENTS BY VEHICLES AND EQUIPMENT IS MINIMIZED. ALL SUCH OFF-SITE SEDIMENT SHALL BE CLEANED UP DAILY.

WEEKLY STREET CLEANING IS REQUIRED THROUGHOUT THE DURATION OF THE PROJECT. THIS INCLUDES POWER SWEEPING, POWER CLEANING, AND MANUAL (IF NECESSARY) REMOVAL OF DIRT OR MUD IN THE STREET GUTTERS.

INSPECTIONS
THE NPDES PERMIT HOLDER SHALL PROVIDE QUALIFIED PERSONNEL TO CONDUCT SITE INSPECTIONS ENSURING PROPER FUNCTIONALITY OF THE EROSION AND SEDIMENTATION CONTROLS. ALL EROSION AND SEDIMENTATION CONTROLS ARE TO BE INSPECTED ONCE EVERY SEVEN CALENDAR DAYS OR WITHIN 24 HOURS OF A 1/2 INCH STORM EVENT OR GREATER. RECORDS OF THE SITE INSPECTIONS SHALL BE KEPT AND MADE AVAILABLE TO JURISDICTIONAL AGENCIES, THE ENGINEER, AND/OR THE OWNER UPON REQUEST.

MAINTENANCE
IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE SEDIMENTATION AND EROSION CONTROL FEATURES ON THIS PROJECT. ANY SEDIMENT OR DEBRIS THAT HAS REDUCED THE EFFICIENCY OF A CONTROL SHALL BE REMOVED IMMEDIATELY. SHOULD A STRUCTURE OR FEATURE BECOME DAMAGED, THE CONTRACTOR SHALL REPAIR OR REPLACE IT AT NO COST TO THE OWNER.

ANY TRAPPED SEDIMENT OR DEBRIS REMOVED DURING CLEANING OF OR REMOVAL OF INSTALLATIONS SHALL BE PLACED IN AREAS NOT SUBJECT TO EROSION AND PERMANENTLY STABILIZED.

ADDITIONAL EROSION AND SEDIMENT CONTROL SHALL BE REQUIRED AS DIRECTED BY JURISDICTIONAL AGENCIES, THE ENGINEER, AND/OR THE OWNER.

SITE DATA

OWNER:	BERKSHIRE TOWNSHIP TRUSTEES
DEVELOPER:	SAME AS OWNER
PLANS PREPARED BY:	TERRAIN EVOLUTION, INC. ATTN: MIKE WILLIAMSON 720 E. BROAD STREET, SUITE 203 COLUMBUS, OH 43215 P: 614-385-1090 F: 614-385-1085 E: MWILLIAMSON@TERRAINEVOLUTION.COM
DEVELOPMENT TYPE:	COMMERCIAL
PROJECT DESCRIPTION:	SPORT COURTS CONSTRUCTION AND ASSOCIATED UTILITIES
SITE ACREAGE:	18.21 AC. ±
DISTURBED ACREAGE:	0.97 AC. ±
LAND USE:	EXISTING – PUBLIC USE PROPOSED – PUBLIC USE
SWP3 MEASURES:	INLET PROTECTION, FILTER FENCE AND RETENTION BASINS SHALL BE USED AS PRIMARY MEANS OF SEDIMENT CONTROL. EROSION SHALL BE PREVENTED BY APPLYING TEMPORARY & PERMANENT SEEDING AND MULCHING.

CONSTRUCTION ENTRANCE

DESCRIPTION
A CONSTRUCTION ENTRANCE IS A STABILIZED PAD OF STONE UNDERLAIN WITH A GEOTEXTILE FABRIC LOCATED AT POINTS OF INGRESS/EGRESS. THE PRACTICE IS USED TO REDUCE THE AMOUNT OF MUD TRACKED OFF-SITE WITH CONSTRUCTION TRAFFIC.

A CONSTRUCTION ENTRANCE IS APPLICABLE WHERE:
- CONSTRUCTION TRAFFIC LEAVES ACTIVE CONSTRUCTION AREAS AND ENTERS PUBLIC ROADWAYS OR AREAS UNCHECKED BY EFFECTIVE SEDIMENT CONTROLS
- AREAS WHERE FREQUENT VEHICLE AND EQUIPMENT ACCESS IS EXPECTED AND LIKELY TO CONTRIBUTE SEDIMENT TO RUNOFF, SUCH AS AT THE ENTRANCE TO INDIVIDUAL BUILDING LOTS.

PLANNING CONSIDERATIONS
CONSTRUCTION ENTRANCES ADDRESS AREAS THAT CONTRIBUTE SIGNIFICANT AMOUNTS OF MUD TO RUNOFF BY PROVIDING A STABLE AREA FOR TRAFFIC. ALTHOUGH THEY ALLOW SOME MUD TO BE REMOVED FROM CONSTRUCTION VEHICLE TIRES BEFORE THEY ENTER A PUBLIC ROADS, THEY SHOULD NOT BE THE ONLY PRACTICE RELIED UPON TO MANAGE OFF-SITE TRACKING. SINCE MOST MUD IS FLUNG FROM TIRES AS THEY REACH HIGHER SPEEDS, RESTRICTING TRAFFIC TO STABILIZED CONSTRUCTION ROADS, ENTRANCES AND AWAY FROM MUDDY AREAS IS NECESSARY.

IF A CONSTRUCTION ENTRANCE IS NOT SUFFICIENT TO REMOVE THE MAJORITY OF MUD FROM WHEELS OR THERE IS AN ESPECIALLY SENSITIVE TRAFFIC SITUATION ON ADJACENT ROADS, WHEEL WASH AREAS MAY BE NECESSARY. THIS REQUIRES AN EXTENDED WIDTH PAD TO AVOID CONFLICTS WITH TRAFFIC, A SUPPLY OF WASH WATER AND SUFFICIENT DRAINAGE TO ASSURE RUNOFF IS CAPTURED IN A SEDIMENT POND OR TRAP.

PROPER INSTALLATION OF A CONSTRUCTION ENTRANCE REQUIRES A GEOTEXTILE AND PROPER DRAINAGE TO INSURE CONSTRUCTION SITE RUNOFF DOES NOT LEAVE THE SITE. THE USE OF GEOTEXTILE UNDER THE STONE HELPS TO PREVENT POTHOLES FROM DEVELOPING AND WILL SAVE THE AMOUNT OF STONE NEEDED DURING THE LIFE OF THE PRACTICE. PROPER DRAINAGE MAY INCLUDE CULVERTS TO DIRECT WATER UNDER THE ROADWAY OR WATER BARS TO DIRECT MUDDY WATER OFF THE ROADWAY TOWARD SEDIMENT TRAPS OR PONDS.

DESIGN CRITERIA
THE AREA OF THE ENTRANCE MUST BE CLEARED OF ALL VEGETATION, ROOTS, AND OTHER OBJECTIONABLE MATERIAL. THE GEOTEXTILE WILL THEN BE PLACED THE FULL WIDTH AND LENGTH OF THE ENTRANCE.

STONE SHALL BE PLACED TO A DEPTH OF AT LEAST SIX (6) INCHES. ROADS SUBJECT TO HEAVY DUTY LOADS SHOULD BE INCREASED TO A MINIMUM OF TEN (10) INCHES. SURFACE WATER SHALL BE CONVEYED UNDER THE ENTRANCE, THROUGH CULVERTS, OR DIVERTED VIA WATER BARS OR MOUNTABLE BERMS (MINIMUM 5:1 SLOPES) SO AS TO CONVEY SEDIMENT LADEN RUNOFF TO SEDIMENT CONTROL PRACTICES OR TO ALLOW CLEAN WATER TO PASS BY THE ENTRANCE.

THE STABILIZED CONSTRUCTION ENTRANCE SHALL MEET THE SPECIFICATIONS INCLUDED IN THE DETAIL ON THESE PLANS.

MAINTENANCE
THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR THE WASHING AND REWORKING OF EXISTING STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANING OF ANY STRUCTURES USED TO TRAP SEDIMENT. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY. THE USE OF WATER TRUCKS TO REMOVE MATERIALS DROPPED, WASHED, OR TRACKED ONTO ROADWAYS WILL NOT BE PERMITTED UNDER ANY CIRCUMSTANCES.

COMMON PROBLEMS/CONCERNS
1. MUD IS ALLOWED TO ACCUMULATE AND IS TRACKED ON TO PUBLIC RIGHT-OF-WAYS. THE ENTRANCE AND ASSOCIATED CONSTRUCTION ROADS MAY NEED DRESSING WITH ADDITIONAL STONE.
2. SOFT DEPRESSION AREAS DEVELOP IN ENTRANCE AREA. STONE MAY NOT HAVE BEEN UNDERLAIN WITH GEOTEXTILE OR INSUFFICIENT STONE BASE HAS BEEN PROVIDED.

CLEARING & GRUBBING

DESCRIPTION
CLEARING AND GRUBBING IS THE REMOVAL OF TREES, BRUSH AND OTHER UNWANTED MATERIAL IN ORDER TO DEVELOP LAND FOR OTHER USES OR PROVIDE ACCESS FOR SITE WORK. CLEARING GENERALLY DESCRIBES THE CUTTING AND REMOVAL OF ABOVE GROUND MATERIAL WHILE GRUBBING IS THE REMOVAL OF ROOTS, STUMPS, AND OTHER UNWANTED MATERIAL BELOW EXISTING GRADE.

CLEARING AND GRUBBING INCLUDES THE PROPER DISPOSAL OF MATERIALS AND THE IMPLEMENTATION OF BEST MANAGEMENT PRACTICES IN ORDER TO MINIMIZE EXPOSURE OF SOIL TO EROSION AND CAUSING DOWNSTREAM SEDIMENTATION.

THIS PRACTICE MAY BE APPLIED ANYWHERE EXISTING TREES AND OTHER MATERIAL MUST BE REMOVED FOR DEVELOPMENT TO OCCUR. THE POTENTIAL FOR EROSION AND SEDIMENTATION INCREASES AS: THE VEGETATION REMOVED; AREA DISTURBED OR WATERCOURSES ENCOUNTERED INCREASES.

SITE ASSESSMENT, SELECTION, & MARKING
SITES SHOULD BE ASSESSED TO DETERMINE AREAS TO BE LEFT UNDISTURBED AS WELL AS TREES OR VEGETATED AREAS TO BE SAVED. THESE AREAS NEED TO BE CLEARLY MARKED ON PLANS AND IN THE FIELD. LAND CLEARING ACTIVITIES SHOULD NOT BEGIN UNTIL THE SITE ASSESSMENT AND THE FIELD MARKING IS CONCLUDED.

TIMING AND PHASING
LARGE-SCALE SITES SHOULD BE CLEARED IN PHASES, WITH INITIATION OF EACH PHASE DELAYED UNTIL ACTUAL CONSTRUCTION IS SCHEDULED FOR THAT AREA OF THE SITE.

EROSION, SEDIMENT AND STREAM INSTABILITY POTENTIAL
CLEARING IN SOME AREAS SHOULD BE AVOIDED OR DELAYED DUE TO THE POTENTIAL FOR DESTABILIZATION. CLEARED SITES ON HEAVY SOILS AND STEEP SLOPES ARE SUBJECT TO EXCESSIVE EROSION AND MAY REQUIRE ADDITIONAL PRACTICES TO KEEP THE SOIL IN PLACE. LAND CLEARING DURING DRY OR FROZEN TIMES WILL DECREASE COMPACTION AND POTENTIAL WATER QUALITY PROBLEMS FROM RUNOFF.

STREAM CORRIDORS SHOULD BE LEFT INTACT UNTIL PLANS HAVE BEEN MADE TO IMMEDIATELY RESTORE STABLE CONDITIONS. THESE AREAS ARE SUBJECT TO RAPID EROSION ONCE VEGETATION IS REMOVED AND SOON BECOME A SOURCE OF SEDIMENT DOWNSTREAM. ALTERNATIVELY NATURALLY VEGETATED STREAM CORRIDORS HELP PROTECT WATER RESOURCES FROM POLLUTION GENERATED DURING GRUBBING AND GRADING OPERATIONS.

GRUBBING
GRUBBING REMOVES ROOTS AND STUMPS BY DIGGING OR PUSHING OVER WITH EARTH MOVING EQUIPMENT. GRUBBING SHOULD BE CAREFULLY MONITORED NEAR LAKES AND STREAMS TO PROTECT THE WATER'S EDGE. REMOVING ROOT SYSTEMS NEAR THE BANKS OF STREAMS AND LAKES MAKE CAUSE THE AREA TO BECOME UNSTABLE AND ERODE. IF POSSIBLE, AVOID GRUBBING AT ALL NEAR THE WATER'S EDGE.

TREE REMOVAL
1. WHERE TREES AND STUMPS ARE REMOVED IN SEPARATE OPERATIONS, TREES MAY BE USED FOR COMMERCIAL PURPOSES SUCH AS LUMBER, FIREWOOD, OR MULCH.
2. TREES AND STUMPS MAY BE REMOVED IN ONE OPERATION. THIS METHOD LEAVES MATERIALS THAT CAN BE USEFUL IN STREAM RESTORATION AND STABILIZATION (E.G ROOTWADS, VANES). BE CERTAIN THAT SUFFICIENT TRUNK IS LEFT FOR EFFECTIVE ANCHORING IN THE BANK. TOPS OF TREES SHOULD BE REMOVED AND CHIPPED FOR MULCH.
3. OPERATING HEAVY EQUIPMENT TOO CLOSE TO TREES WILL RESULT IN DAMAGE OR LOSS DUE TO SOIL DISRUPTION, COMPACTION AND TRUNK DAMAGE. IT IS RECOMMENDED THAT ALL HEAVY EQUIPMENT OPERATIONS BE LIMITED TO OUTSIDE THE DRIP LINE OF ALL TREES TO BE PRESERVED. THE DRIP LINE IS THE AREA FROM THE TRUNK OF THE TREE OUTWARD TO A POINT AT WHICH THERE IS NO LONGER ANY OVERHANGING VEGETATION.
4. IN FORESTED WETLANDS, SHALLOW-ROOTED SPECIES ARE PROTECTED BY EACH OTHER FROM POTENTIAL WIND DAMAGE. WHENEVER TREES ARE REMOVED FROM A FORESTED WETLAND, THE POSSIBILITY OF BLOW DOWNS OR WINDTHROW INCREASES. SHALLOW ROOTED SPECIES ARE ALSO PROTECTED BY EDGE TREES, WHICH SHIELD THE PREVAILING WIND SIDE OF THE WOODLOT. IT IS HELPFUL TO LEAVE AS MANY EDGE TREES AS POSSIBLE ON THE PREVAILING WIND SIDE OF THE CLEARED AREA.

DISPOSAL OPTIONS
WHERE POSSIBLE, ALL STUMPS, ROOTS, LOGS, BRUSH, LIMBS, TOPS AND OTHER DEBRIS RESULTING FROM THE CLEARING OR THINNING OPERATION SHOULD BE DISPOSED OF BY PROCESSING THROUGH A CHIPPING MACHINE. THE CHIPS CAN THEN BE UTILIZED AS MULCH (SEE MULCHING PRACTICE), AS PART OF A SITE STABILIZATION OR FINAL LANDSCAPING PLAN. ORGANIC MATERIAL MAY ALSO BE DISPOSED OF AT AN APPROVED COMPOSTING FACILITY.

NOTE THAT TREETOPS, STUMPS AND FIELD STONE WHICH ARE CLEARED AND PILED/WINDROWED IN SUITABLE AREAS CAN IMPROVE HABITAT FOR WILDLIFE SUCH AS RABBITS, RACCOONS, SNAKES, SALAMANDERS, TOADS AND FROGS.

MAINTENANCE
LAND CLEARING ITSELF REQUIRES NO MAINTENANCE EXCEPT MAINTENANCE OF THE EQUIPMENT USED IN THE LAND CLEARING OPERATION. TREE PROTECTION THAT UTILIZES FENCING AND SIGNAGE SHOULD BE MAINTAINED THROUGHOUT THE CLEARING STAGES. IT IS ALSO IMPORTANT TO MAINTAIN ALL OTHER TEMPORARY AND PERMANENT PRACTICES THAT ARE USED IN CONJUNCTION WITH THE LAND CLEARING TO PREVENT SOIL EROSION AND SEDIMENTATION.

COMMON PROBLEMS/CONCERNS
1. CLEARING OF AREAS PLANNED FOR PRESERVATION MAY OCCUR AND DESIRABLE SPECIES MAY BE DAMAGED, THEREFORE PRESERVATION AREAS SHOULD BE WELL MARKED.
2. DURING CONSTRUCTION, NATURALLY VEGETATED BANKS OF STREAM AND LAKES MAY BECOME DESTABILIZED. CLEARLY MARK AREAS WHERE NATURAL VEGETATION MUST BE MAINTAINED, AND IMMEDIATELY IMPLEMENT STABILIZATION PLANS OF DENUDED AREAS.
3. AS LARGE AREAS ARE DISTURBED, SITE EROSION POTENTIAL DRASTICALLY INCREASES UNTIL COVER IS RE-ESTABLISHED. ESTABLISH TEMPORARY SEEDINGS AS SOON AS CLEARING/GRUBBING AND GRADING ACTIVITIES STOP OR BECOME IDLE.

DUST CONTROL

DESCRIPTION
DUST CONTROL INVOLVES PREVENTING OR REDUCING DUST FROM EXPOSED SOILS OR OTHER SOURCES DURING LAND DISTURBING, DEMOLITION AND CONSTRUCTION ACTIVITIES TO REDUCE THE PRESENCE OF AIRBORNE SUBSTANCES WHICH MAY PRESENT HEALTH HAZARDS, TRAFFIC SAFETY PROBLEMS OR HARM ANIMAL OR PLANT LIFE.

DUST CONTROL MEASURES ARE REQUIRED IN AREAS SUBJECT TO SURFACE AND AIR MOVEMENT OF DUST WHERE ON-SITE AND OFF-SITE DAMAGE IS LIKELY TO OCCUR IF PREVENTATIVE MEASURES ARE NOT TAKEN.

PLANNING CONSIDERATIONS
CONSTRUCTION ACTIVITIES INEVITABLY RESULT IN THE EXPOSURE AND DISTURBANCE OF SOIL. FUGITIVE DUST RESULTS FROM BOTH CONSTRUCTION ACTIVITIES AND AS A RESULT OF WIND EROSION OVER THE EXPOSED EARTH SURFACES. LARGE QUANTITIES OF DUST ARE TYPICALLY GENERATED IN HEAVY CONSTRUCTION ACTIVITIES, SUCH AS ROAD CONSTRUCTION AND SUBDIVISION, COMMERCIAL OR INDUSTRIAL DEVELOPMENT, WHICH INVOLVE DISTURBING SIGNIFICANT AREAS OF THE SOIL SURFACE. RESEARCH OF CONSTRUCTION SITES HAS ESTABLISHED AN AVERAGE DUST EMISSION RATE OF 1.2 TONS/ACRE/MONTH FOR ACTIVE CONSTRUCTION. EARTH-MOVING ACTIVITIES COMPRISE THE MAJOR SOURCE OF CONSTRUCTION DUST EMISSIONS, BUT TRAFFIC AND GENERAL DISTURBANCE OF THE SOIL ALSO GENERATE SIGNIFICANT DUST EMISSIONS.

PLANNING FOR DUST CONTROL INVOLVES LIMITING THE AMOUNT OF SOIL DISTURBANCE AT ANY ONE TIME AS A KEY OBJECTIVE. THEREFORE, PHASED CLEARING AND GRADING OPERATIONS (MINIMIZE DISTURBANCE-PHASING) AND THE UTILIZATION OF OTHER STABILIZATION PRACTICES CAN SIGNIFICANTLY REDUCE DUST EMISSIONS. UNDISTURBED VEGETATIVE BUFFERS (MINIMUM 50-FOOT WIDTHS) LEFT BETWEEN GRADED AREAS AND PROTECTED AREAS CAN ALSO BE VERY HELPFUL IN DUST CONTROL BY PROVIDING WINDBREAKS AND NON-EROSIVE AREAS.

DESIGN CRITERIA
A NUMBER OF MEASURES CAN BE UTILIZED TO LIMIT DUST EITHER DURING OR BETWEEN CONSTRUCTION STAGES OR ONCE CONSTRUCTION IS COMPLETE. GENERALLY THE SAME METHODS THAT ARE USED TO LIMIT EROSION BY LIMITING EXPOSURE OF SOILS TO RAINFALL CAN BE USED TO LIMIT DUST INCLUDING: STABILIZING EXPOSED SOILS WITH MULCH, VEGETATION OR PERMANENT COVER. ADDITIONAL METHODS PARTICULAR TO DUST CONTROL INCLUDE MANAGING VEHICLES AND CONSTRUCTION TRAFFIC, ROAD TREATMENT AND TREATMENT OF EXPOSED SOIL WITH CHEMICAL STABILIZERS.

VEGETATIVE COVER
THE MOST EFFECTIVE WAY TO PREVENT DUST FROM EXPOSED SOIL IS TO PROVIDE A DENSE COVER OF VEGETATION. IN AREAS SUBJECT TO LITTLE OR NO CONSTRUCTION TRAFFIC, VEGETATIVE STABILIZATION REDUCES DUST DRASTICALLY. TIMELY TEMPORARY AND PERMANENT SEEDINGS MUST BE UTILIZED TO ACCOMPLISH THIS.

MULCH
WHEN PROPERLY APPLIED, MULCH OFFERS A FAST, EFFECTIVE MEANS OF CONTROLLING DUST. MULCHING IS NOT RECOMMENDED FOR AREAS WITHIN HEAVY TRAFFIC PATHWAYS. BINDERS OR TACKIFIERS SHOULD BE USED TO TACK ORGANIC MULCHES.

ROUGH GRADED SOILS
LEAVING THE SOIL IN A TEMPORARY STATE OF ROUGH GRADE, WHERE CLODS RATHER THAN FLATTENED SOILS PREDOMINATE THE SURFACE, CAN REDUCE THE AMOUNT OF DUST GENERATED FROM AREAS DURING PERIODS OF HIGHER WINDS. THIS MUST BE BALANCED BY THE NEED TO REACH A STAGE WHERE THE SOIL CAN BE STABILIZED AND MAY BE ONLY BE NECESSARY WHEN HIGH WINDS ARE PREDICTED.

WATERING
THIS IS THE MOST COMMONLY USED DUST CONTROL PRACTICE. THE SITE IS SPRINKLED WITH WATER UNTIL THE SURFACE IS WET BEFORE AND DURING GRADING AND IS REPEATED AS NEEDED. IT OFFERS FAST PROTECTION FOR HAUL ROADS AND OTHER HEAVY TRAFFIC ROUTES. WATERING SHOULD BE DONE AT A RATE THAT PREVENTS DUST BUT DOES NOT CAUSE SOIL EROSION. WETTING AGENTS ARE ALSO AVAILABLE TO INCREASE THE EFFECTIVENESS OF WATERING AND MUST FOLLOW MANUFACTURERS INSTRUCTIONS.

CHEMICAL STABILIZERS/WETTING AGENTS
MANY PRODUCTS OF THIS TYPE ARE AVAILABLE AND ARE USUALLY MOST EFFECTIVE ON TYPICAL MINERAL SOILS, BUT MAY NOT BE ON PREDOMINANTLY ORGANIC SOILS SUCH AS MUCK. USERS ARE ADVISED TO PAY ATTENTION TO THE LIMITATIONS AND INSTRUCTIONS REGARDING EACH PRODUCT. THE FOLLOWING TABLE LISTS VARIOUS ADHESIVES AND PROVIDES CORRESPONDING INFORMATION ON MIXING APPLICATIONS:

DUST CONTROL ADHESIVES

ADHESIVE	WATER DILUTION (ADHESIVE:WATER)	NOZZLE TYPE	APPLICATION RATE (GAL/ACRE)
LATEX EMULSION	12.5:1	FINE	235
RESIN IN WATER	4:1	FINE	300
ACRYLIC EMULSION (NO TRAFFIC)	7:1	COARSE	450
ACRYLIC EMULSION (TRAFFIC)	3.5:1	COARSE	350

STONE
STONE CAN BE USED TO STABILIZE ROADS OR OTHER AREAS DURING CONSTRUCTION USING CRUSHED STONE OR COARSE GRAVEL. RESEARCH HAS SHOWN THE ADDITION OF BENTONITE TO LIMESTONE ROADS (NOT IGNEOUS GRAVEL) HAS SHOWN BENEFITS IN REDUCING DUST.

WINDBREAKS AND BARRIERS
WHERE DUST IS A KNOWN PROBLEM, EXISTING WINDBREAK VEGETATION SHOULD BE PRESERVED. MAINTAINING EXISTING ROWS OF TREES OR CONSTRUCTING A WIND FENCE, SEDIMENT FENCE, OR SIMILAR BARRIER CAN HELP TO CONTROL AIR CURRENTS AND BLOWING SOIL. PLACE BARRIERS PERPENDICULAR TO PREVAILING AIR CURRENTS AT INTERVALS OF ABOUT 15 TIMES THE BARRIER HEIGHT.

CALCIUM CHLORIDE
THIS CHEMICAL MAY BE APPLIED BY MECHANICAL SPREADER AS LOOSE, DRY GRANULES OR FLAKES AT A RATE THAT KEEPS THE SURFACE MOIST BUT NOT SO HIGH AS TO CAUSE WATER POLLUTION OR PLANT DAMAGE. LIQUID APPLICATION OF A 35% CALCIUM CHLORIDE SOLUTION IS COMMON. NOTE: APPLICATION RATES SHOULD BE STRICTLY IN ACCORDANCE WITH SUPPLIERS' SPECIFIED RATES.

STREET CLEANING
PAVED AREAS THAT HAVE ACCUMULATED SEDIMENT FROM CONSTRUCTION SITES SHOULD BE CLEANED DAILY, OR AS NEEDED, UTILIZING A STREET SWEEPER OR BUCKET-TYPE LOADER OR SCRAPER.

MAINTENANCE
MOST DUST CONTROL MEASURES, SUCH AS APPLICATIONS OF WATER OR ROAD TREATMENTS WILL REQUIRE MONITORING AND REPEAT APPLICATIONS AS NEEDED TO ACCOMPLISH GOOD CONTROL.

COMMON PROBLEMS/CONCERNS
1. VEGETATION IS REMOVED FROM LARGE AREAS OF THE CONSTRUCTION SITE AND LEFT BARREN FOR LONG PERIODS OF TIME.
2. CONTINUOUS, SCHEDULED MONITORING OF THE CONSTRUCTION SITE CONDITIONS IS NOT MADE.

GRADE TREATMENT / SURFACE ROUGHENING

DESCRIPTION
GRADE TREATMENT OR SURFACE ROUGHENING CREATES HORIZONTAL DEPRESSIONS IN THE SOIL SURFACE THAT HELP TO REDUCE EROSION BY REDUCING RUNOFF VELOCITY AND INCREASING INFILTRATION. THESE DEPRESSIONS AID IN THE ESTABLISHMENT OF VEGETATIVE COVER AND PROVIDE LOCALIZED TRAPPING OF SEDIMENTS. GRADE TREATMENT IS TYPICALLY CREATED BY OPERATING TILLAGE IMPLEMENTS ON THE CONTOUR OR BY RUNNING TRACKED EQUIPMENT UP AND DOWN A SLOPE WITHOUT FINE GRADING THE SURFACE.

CONDITIONS WHERE PRACTICE APPLIES
1. ALL SLOPES STEEPER THAN 3:1 REQUIRE GRADE TREATMENT, EITHER STAIR-STEP GRADING, GROOVING, FURROWING, OR TRACKING IF THEY ARE TO BE STABILIZED WITH VEGETATION.
2. AREAS WITH GRADES LESS STEEP THAN 3:1 SHOULD HAVE THE SOIL SURFACE LIGHTLY ROUGHENED AND LOOSE TO A DEPTH OF TWO (2) TO FOUR (4) INCHES PRIOR TO SEEDING.
3. AREAS THAT HAVE BEEN GRADED AND WILL NOT BE SEEDED IMMEDIATELY MAY BE ROUGHENED TO REDUCE RUNOFF VELOCITY UNTIL SEEDING TAKES PLACE.
4. SLOPES WITH A STABLE ROCK FACE DO NOT REQUIRE ROUGHENING OR STABILIZATION.

PLANNING CONSIDERATIONS
A GRADING PLAN SHOULD BE DEVELOPED TO ESTABLISH DRAINAGE AREAS, DIRECT DRAINAGE PATTERNS, AND DECREASE RUNOFF VELOCITIES. THE PLAN SHOULD COORDINATE THE GRADING WITH THE EROSION/SEDIMENTATION CONTROL PLAN AND THE STORMWATER MANAGEMENT PLAN. GRADING SHOULD BE DONE IN STAGES ACCORDING TO THE IMPLEMENTATION SCHEDULE, THUS LIMITING THE AMOUNT OF SURFACE AREA LEFT IN A DISTURBED, UNSTABLE CONDITION. WHEN GRADING, LEAVE A NATURAL BUFFER BETWEEN THE DISTURBED AREAS AND THE WATER BODY (50 FT. MINIMUM RECOMMENDED). IF A NATURAL BUFFER CANNOT BE LEFT, CONSTRUCT A BERM OR INSTALL OTHER APPROPRIATE SEDIMENT CONTROL BMPS (E.G. SEDIMENT TRAP, SILT FENCE) ADJACENT TO THE WATER BODY.

PRIOR TO PLACING FILL, TOPSOIL AND ORGANIC MATERIALS SHOULD BE REMOVED. TO PREVENT DIFFERENTIAL SETTLEMENT, FILL SHOULD BE FREE OF OBJECTIONABLE MATERIALS SUCH AS LOGS, ROCKS AND STUMPS. FROZEN FILL OR ORGANIC (MUCK) MATERIALS SHOULD NOT BE USED.

SPOIL AND TOPSOIL PILES SHALL NOT BE LOCATED IN OR NEAR DRAINAGEWAYS AND SHALL BE STABILIZED AS SOON AS POSSIBLE BY SEEDING AND MULCHING. PLACING PILES ADJACENT TO CHANNEL BANKS WHERE IT MAY CREATE BANK FAILURE OR RESULT IN DEPOSITION OF SEDIMENT DOWNSTREAM SHOULD BE AVOIDED.

GRADED AREAS WITH SMOOTH, HARD SURFACES GIVE A FALSE IMPRESSION OF "FINISHED GRADING" AND A JOB WELL DONE. IT IS DIFFICULT TO ESTABLISH VEGETATION ON SUCH SURFACES DUE TO REDUCED WATER INFILTRATION AND THE POTENTIAL FOR EROSION. ROUGH SLOPE SURFACES WITH UNEVEN SOIL AND ROCKS LEFT IN PLACE MAY APPEAR UNATTRACTIVE OR UNFINISHED AT FIRST, BUT ENCOURAGE WATER INFILTRATION, SPEED THE ESTABLISHMENT OF VEGETATION, AND DECREASE RUNOFF VELOCITY.

ROUGH LOOSE SOIL SURFACES GIVE LIME, FERTILIZER AND SEED SOME NATURAL COVERAGE. NICHES IN THE SURFACE PROVIDE MICROCLIMATES THAT GENERALLY PROVIDE A COOLER AND MORE FAVORABLE MOISTURE LEVEL THAN HARD FLAT SURFACES, THEREBY AIDING SEED GERMINATION.

CHANGE ORDER SCHEDULE

#	DESCRIPTION OF CHANGE	REVISION BY	REVISION DATE

TerrainEvolution
*Your bridge between **Vision** and **Success***
720 East Broad Street | Suite 203 | Columbus, OH 43215
P: 614.385.1090 | **F:** 614.385.1085 | **E:** info@terrainevolution.com

BERKSHIRE TOWNSHIP, DELAWARE COUNTY, OHIO
BERKSHIRE TOWNSHIP RECREATIONAL COURTS
1454 ROME CORNERS ROAD
STORMWATER POLLUTION PREVENTION NOTES

DRAWING SET STATUS:
- ☐ PRELIMINARY ENGINEERING SET
- ☐ AGENCY REVIEW SET
- ■ CONSTRUCTION DOCUMENT SET
- ☐ AS-BUILT DOCUMENT SET

DESIGN	DRAFT	CHECK
DGR	DGR	MSW

PROJECT NO.: 25-002
DATE: MARCH, 2025
SCALE: HORIZONTAL: N/A VERTICAL: N/A

GRADE TREATMENT / SURFACE ROUGHENING (CONT'D)

DESIGN CRITERIA
GRADE TREATMENT IS TO BE PERFORMED ONLY AFTER ALL CUTS AND FILLS ARE MADE AND BROUGHT TO THE FINAL SHAPE AND GRADE.

THERE ARE DIFFERENT METHODS FOR ACHIEVING A ROUGHENED SOIL SURFACE ON A SLOPE, AND THE SELECTION OF AN APPROPRIATE METHOD DEPENDS UPON THE TYPE OF SLOPE. GRADING METHODS INCLUDE STAIR-STEP GRADING, GROOVING, AND TRACKING.

STAIR-STEP GRADING
THIS METHOD SHOULD BE DONE ON SLOPES STEEPER THAN 3:1 WITH MATERIAL SOFT ENOUGH TO BE BULLDOZED AND WHICH WILL NOT BE MOWED. THE VERTICAL CUT SHOULD BE LESS THAN THE HORIZONTAL DISTANCE AND SHOULD NOT EXCEED TWO (2) FEET IN SOFT MATERIAL AND THREE (3) FEET IN ROCKY MATERIAL. THE HORIZONTAL POSITION OF THE "STEP" SHOULD BE SLOPED TOWARD THE VERTICAL UP-HILL WALL.

GROOVING
THIS METHOD CAN BE DONE ON ANY AREA, WHICH CAN SAFELY ACCOMMODATE DISKS, TILLERS, SPRING HARROW, OR THE TEETH OF A FRONT-END LOADER BUCKET. IN AREAS, WHICH WILL NOT BE MOWED, USE EQUIPMENT TO CREATE GROOVES PERPENDICULAR TO THE SLOPE. GROOVES SHOULD NOT BE LESS THAN THREE (3) INCHES DEEP, NOR MORE THAN FIFTEEN (15) INCHES APART. IN CUTS, FILLS, AND AREAS THAT WILL BE MOWED, GROOVES SHOULD BE LESS THAN TEN (10) INCHES APART AND NOT LESS THAN ONE (1) INCH DEEP.

TRACKING
THIS METHOD IS DONE BY RUNNING TRACKED MACHINERY (SUCH AS BULLDOZERS) UP AND DOWN SLOPES TO LEAVE HORIZONTAL DEPRESSIONS IN THE SOIL. BACK-BLADING SHOULD NOT BE DONE DURING THE FINAL GRADING OPERATION.

TRACKING OR ROUGHENING WITH TRACKED MACHINERY IS NOT RECOMMENDED ON CLAYEY SOILS, UNLESS OTHER ALTERNATIVES ARE UNAVAILABLE, DUE TO ITS LIKELIHOOD OF CAUSING COMPACTION OF THE SURFACE SOIL. SANDY SOILS DO NOT COMPACT SEVERELY, AND MAY BE TRACKED. IN NO CASE IS TRACKING AS EFFECTIVE AS THE OTHER ROUGHENING METHODS DESCRIBED. TO ROUGHEN WITH TRACKED MACHINERY, OPERATE THE EQUIPMENT UP AND DOWN THE SLOPE, TO LEAVE HORIZONTAL DEPRESSIONS IN THE SOIL, WITH AS FEW PASSES OF THE MACHINERY AS POSSIBLE TO MINIMIZE COMPACTION.

METHODOLOGY DETERMINATION
FACTORS TO BE CONSIDERED IN CHOOSING A METHOD ARE SLOPE STEEPNESS, MOWING REQUIREMENTS, AND WHETHER THE SLOPE IS FORMED BY CUTTING OR FILLING.

1. DISTURBED AREAS, WHICH WILL NOT REQUIRE MOWING, MAY BE STAIR-STEP GRADED, TRACKED, GROOVED, OR LEFT ROUGH AFTER FILLING.
2. STAIR-STEP GRADING IS PARTICULARLY APPROPRIATE IN SOILS CONTAINING LARGE AMOUNTS OF SOFT ROCK. EACH "STEP" CATCHES MATERIAL SHED FROM ABOVE, AND PROVIDES A LEVEL SITE WHERE VEGETATION CAN BECOME ESTABLISHED.
3. AREAS THAT WILL BE MOWED (THESE AREAS SHOULD HAVE SLOPES 3:1 OR FLATTER) MAY HAVE SMALL FURROWS LEFT BY DISCING, HARROWING, RAKING, OR SEED-PLANTING MACHINERY OPERATED ON THE CONTOUR.
4. AVOID EXCESSIVE COMPACTING OF THE SOIL SURFACE WHEN SCARIFYING. TRACKING WITH BULLDOZER TREADS IS PREFERABLE TO NOT ROUGHENING AT ALL, BUT IS NOT AS EFFECTIVE AS OTHER FORMS OF ROUGHENING, AS THE SOIL SURFACE MAY BE COMPACTED AND RUNOFF INCREASED.

MAINTENANCE
ROUGHENED AREAS SHALL BE SEEDED AND MULCHED WITHIN SEVEN (7) DAYS OF LAST DISTURBANCE TO OBTAIN OPTIMUM SEED GERMINATION AND SEEDLING GROWTH.

COMMON PROBLEMS/CONCERNS
1. SEVERE COMPACTION DUE TO EQUIPMENT OPERATION – RESULTS IN UNSUITABLE SEEDBED AND POOR VEGETATION ESTABLISHMENT.
2. ROUGH AREAS DIFFICULT TO MOW – CAUSED BY CUTTING GROOVES TOO DEEP OR EXCESSIVE EROSION FROM GROOVES NOT BEING ON THE CONTOUR.
3. GROOVING DONE PERPENDICULAR, RATHER THAN PARALLEL TO SLOPE – RESULTS IN ACCELERATED EROSION.

TOPSOILING

DESCRIPTION
TOPSOILING OCCURS DURING GRADING OPERATIONS AS THE UPPER MOST ORGANIC LAYER OF SOIL IS STRIPPED AND STOCKPILED FROM AREAS BEING GRADED AND SUBSEQUENTLY REPLACED ON THE NEWLY GRADED AREAS. TOPSOIL PROVIDES A MORE SUITABLE GROWING MEDIUM THAN SUBSOIL OR ON AREAS WITH POOR MOISTURE, LOW NUTRIENT LEVELS, UNDESIRABLE PH, OR IN THE PRESENCE OF OTHER MATERIALS THAT WOULD INHIBIT ESTABLISHMENT OF VEGETATION. REPLACING TOPSOIL HELPS PLANT GROWTH BY IMPROVING THE WATER HOLDING CAPACITY AND NUTRIENT CONTENT AND CONSISTENCY OF THE SOILS.

THIS PRACTICE APPLIES ANYWHERE A GOOD STAND OF VEGETATION IS DESIRED (E.G. TURF, ORNAMENTAL PLANTS, AND/ OR VEGETATIVE COVER), ESPECIALLY IN AREAS WHERE HIGH-QUALITY TURF IS DESIRABLE TO WITHSTAND INTENSE USE OR MEET AESTHETIC REQUIREMENTS, ALTHOUGH IT MAY NOT BE APPROPRIATE FOR AREAS WITH SLOPES GREATER THAN 2:1.

THIS PRACTICE IS ESPECIALLY APPLICABLE TO AREAS WHERE:
- EXISTING SOIL STRUCTURE, PH, OR NUTRIENT BALANCE CANNOT BE EASILY IMPROVED WITH SOIL AMENDMENTS TO BE A SUITABLE GROWTH MEDIUM.
- EXISTING SOILS ARE TOO SHALLOW TO PROVIDE ADEQUATE ROOTING DEPTH OR;
- THE EXISTING SOIL CONTAINS SUBSTANCES TOXIC TO THE DESIRED VEGETATION.

PLANNING CONSIDERATIONS
TOPSOIL IS THE UPPER LAYER OF NATURAL SOIL (A HORIZON), WHICH IS TYPICALLY DARKER AND MORE FERTILE THAN THE SUBSOIL DUE TO INCREASED AMOUNTS OF ORGANIC MATERIAL. THIS LAYER IS TYPICALLY VERY EVIDENT AS A PERSON EXCAVATES THROUGH SOIL HORIZONS. PROJECT SITES WILL HAVE VARYING DEGREES OF TOPSOIL RESOURCES PRIOR TO CONSTRUCTION, WITH SOME HISTORICALLY ERODED SITES HAVING LIMITED TOPSOIL RESOURCES. THESE SITES MAY HAVE LESS JUSTIFICATION FOR MOVING, STOCKPILING AND RE-SPREADING THE TOP HORIZON OF SOIL. IF IN QUESTION, ASSISTANCE BY A TRAINED SOILS PROFESSIONAL SHOULD BE SOUGHT TO DETERMINE THE EXTENT OF TOPSOIL RESOURCES ON THE PROJECT SITE.

TOPSOILING WILL ALSO ADD TIME TO GRADING OPERATIONS AND MAY INCREASE THE EXPOSURE TIME OF DENUDED AREAS. ADDITIONALLY, DEPENDING ON THE ORIGINAL VEGETATIVE COVER, TOPSOIL OFTEN CONTAINS WEED SEEDS THAT MAY COMPETE WITH DESIRABLE SPECIES.

IN SITE PLANNING, THE OPTION OF TOPSOILING SHOULD BE COMPARED WITH THAT OF PREPARING A SEEDBED IN SUBSOIL. THE CLAY CONTENT OF SUBSOIL DOES PROVIDE HIGH MOISTURE AVAILABILITY AND DETERS LEACHING OF NUTRIENTS. WHEN ADJUSTED FOR OPTIMAL PH AND NUTRIENT AVAILABILITY, SUBSOIL MAY PROVIDE AN ADEQUATE GROWTH MEDIUM THAT IS GENERALLY FREE OF WEEDS. TOPSOILING MAY NOT BE REQUIRED TO ESTABLISH LESS DEMANDING, LOWER MAINTENANCE PLANTS, ALTHOUGH RUNOFF WILL BE INCREASED DUE TO THE LACK OF TOPSOIL FROM THE SITE.

IF TOPSOILING IS PLANNED, LOCATIONS FOR TOPSOIL STOCKPILES MUST BE DETERMINED WHERE DRAINAGE AND SITE WORK WILL NOT BE ENCUMBERED. CONSTRUCTION SCHEDULING MUST BE ADJUSTED TO ALLOW SUFFICIENT TIME FOR MOVING, STOCKPILING AND SPREADING TOPSOIL BETWEEN GRADING AND RE-VEGETATION OPERATIONS.

TOPSOILING SPECIFICATIONS

SALVAGING & STOCKPILING
1. DETERMINE THE DEPTH AND SUITABILITY OF TOPSOIL AT THE SITE.
2. PRIOR TO STRIPPING TOPSOIL, INSTALL APPROPRIATE DOWNSLOPE EROSION AND SEDIMENTATION CONTROLS SUCH AS SEDIMENT TRAPS AND BASINS.
3. REMOVE THE SOIL MATERIAL NO DEEPER THAN WHAT THE COUNTY SOIL SURVEY DESCRIBES AS "SURFACE SOIL" (E.G. A OR AP HORIZON).
4. CONSTRUCT STOCKPILES IN ACCESSIBLE LOCATIONS THAT DO NOT INTERFERE WITH NATURAL DRAINAGE. INSTALL APPROPRIATE SEDIMENT CONTROLS IMMEDIATELY ADJACENT TO THE STOCKPILE OR INSTALL SEDIMENT TRAPS/BASINS DOWNSTREAM OF THE STOCKPILE. STOCKPILE SIDE SLOPES SHALL NOT EXCEED A RATIO OF 2:1.
5. IF TOPSOIL IS STORED FOR MORE THAN 21 DAYS, IT SHOULD BE TEMPORARY SEEDED, OR COVERED WITH A TARP.

SPREADING THE TOPSOIL
1. PRIOR TO APPLYING TOPSOIL, THE TOPSOIL SHOULD BE PULVERIZED.
2. TO ENSURE BONDING, GRADE THE SUBSOIL AND ROUGHEN THE TOP THREE TO FOUR (3-4) INCHES BY DISKING.
3. DO NOT APPLY WHEN SITE IS WET, MUDDY, OR FROZEN, BECAUSE IT MAKES SPREADING DIFFICULT, CAUSES COMPACTION PROBLEMS, AND INHIBITS BONDING WITH SUBSOIL.
4. APPLY TOPSOIL EVENLY TO A DEPTH OF AT LEAST FOUR (4) INCHES AND COMPACT SLIGHTLY TO IMPROVE CONTACT WITH SUBSOIL.
5. AFTER SPREADING, GRADE AND STABILIZE WITH SEEDING OR APPROPRIATE VEGETATION.

MAINTENANCE
TOPSOIL STOCKPILES SHOULD BE STABILIZED WITH TEMPORARY VEGETATION AND PROVIDED SUFFICIENT SEDIMENT CONTROLS. SEDIMENT CONTROLS WILL NEED REGULAR INSPECTION AND APPROPRIATE REPAIRS AS NEEDED.

COMMON PROBLEMS/CONCERNS
1. CARE MUST BE TAKEN NOT TO APPLY TOPSOIL TO SUBSOIL IF THE TWO SOILS HAVE CONTRASTING TEXTURES. CLAYEY TOPSOIL OVER SANDY SUBSOIL IS A PARTICULARLY POOR COMBINATION, AS WATER MAY CREEP ALONG THE JUNCTION BETWEEN THE SOIL LAYERS, LEADING TO SLOUGHING OF THE TOPSOIL. SANDY TOPSOIL OVER CLAY SUBSOIL IS EQUALLY LIKELY TO FAIL.
2. IF TOPSOIL AND SUBSOIL ARE NOT PROPERLY BONDED, WATER WILL NOT INFILTRATE THE SOIL PROFILE EVENLY AND IT WILL BE DIFFICULT TO ESTABLISH VEGETATION. TOPSOILING OF STEEP SLOPES IS HIGHLY DISCOURAGED, UNLESS GOOD BONDING OF SOILS CAN BE ACHIEVED.
3. TOPSOIL SHOULD NOT BE APPLIED IN EXCESSIVELY WET/MOIST CONDITIONS.

TEMPORARY SEEDING

DESCRIPTION
TEMPORARY SEEDINGS ESTABLISH TEMPORARY COVER ON DISTURBED AREAS BY PLANTING APPROPRIATE RAPID GROWING ANNUAL GRASSES OR SMALL GRAINS. TEMPORARY SEEDING PROVIDES EROSION CONTROL ON AREAS IN BETWEEN CONSTRUCTION OPERATIONS. GRASSES, WHICH ARE QUICK GROWING, ARE SEEDED AND USUALLY MULCHED TO PROVIDE PROMPT, TEMPORARY SOIL STABILIZATION. IT EFFECTIVELY MINIMIZES THE AREA OF CONSTRUCTION SITE PRONE TO EROSION AND SHOULD BE USED EVERYWHERE THE SEQUENCE OF CONSTRUCTION ALLOWS VEGETATION TO BE ESTABLISHED.

PLANT SELECTION
SELECT THE APPROPRIATE PLANTS FROM THE LISTED BELOW IN THE SPECIFICATIONS. CHOOSE VARIETIES OF TALL FESCUE THAT ARE ENDOPHYTE FREE OR HAVE NON-TOXIC ENDOPHYTES. SEEDING RATES FOR DORMANT SEEDINGS ARE INCREASED BY FIFTY PERCENT (50%). SEE THE PERMANENT SEEDINGS NOTES & SPECIFICATIONS FOR MORE INFORMATION OF DORMANT SEEDINGS.

THE LENGTH OF TIME THE AREA WILL REMAIN IDLE AND THE SEASON IN WHICH SEEDING OCCURS SHOULD INFLUENCE THE SELECTION OF SEEDING SPECIES. FOR AREAS REMAINING IDLE FOR OVER A YEAR, A MIXTURE CONTAINING PERENNIAL RYEGRASS IS RECOMMENDED. CEREAL GRAINS (RYE, OATS, & WHEAT) ARE INCLUDED IN SOME OF THE MIXTURES AS COVER CROPS. THESE ARE ANNUAL PLANTS THAT WILL DIE AFTER PRODUCING SEED. REALIZE THAT OATS WILL NOT CONTINUE TO GROW OVER WINTER AS WHEAT AND RYE DO.

SITE PREPARATION
TEMPORARY SEEDING IS BEST DONE ON A PREPARED SOIL SEEDBED OF LOOSE PULVERIZED SOIL. HOWEVER, SEEDINGS SHOULD NOT BE DELAYED IF ADDITIONAL GRADING OPERATIONS ARE NOT POSSIBLE. AT A MINIMUM, REMOVE LARGE ROCK OR DEBRIS THAT WILL INTERFERE WITH SEEDING OPERATIONS. IF THE GROUND HAS BECOME CRUSTED, A DISK OR A HARROW SHOULD BE USED TO LOOSEN THE SOIL. OVERALL, THE BEST SOIL CONDITIONS WILL EXIST IMMEDIATELY AFTER GRADING OPERATIONS CEASE, WHEN SOILS REMAIN LOOSE AND MOIST.

SOIL AMENDMENTS
A SOIL TEST IS NECESSARY TO ADEQUATELY PREDICT THE NEED FOR LIME AND FERTILIZER. SEEDINGS THAT ARE EXPECTED TO BE LONG LASTING (OVER 1-3 MONTHS), SHOULD HAVE LIME AND FERTILIZER APPLIED AS RECOMMENDED BY A SOIL TEST. IN LIEU OF A SOIL TEST, FERTILIZER CAN BE BROADCAST AND WORKED INTO THE TOP INCH OF SOIL AT THE RATE OF 6 LBS/1000 S.F. OR 250 POUNDS PER ACRE OF 10-10-10 OR 12-12-12.

MAINTENANCE
AREAS FAILING TO ESTABLISH VEGETATIVE COVER ADEQUATE TO PREVENT EROSION SHALL BE RE-SEEDED AS SOON AS SUCH AREAS ARE IDENTIFIED.

SEEDING PERFORMED DURING HOT AND DRY SUMMER MONTHS SHALL BE WATERED AT A RATE OF ONE INCH (1") PER WEEK.

COMMON PROBLEMS/CONCERNS
1. INSUFFICIENT TOPSOIL OR INADEQUATELY TILLED, LIMED, AND/OR FERTILIZED SEEDBED RESULTS IN POOR ESTABLISHMENT OF VEGETATION.
2. AN OVERLY HIGH SEEDING RATE OF NURSE CROP (OAT, RYE OR WHEAT) IN THE SEED MIXTURE RESULTS IN OVER COMPETITION WITH THE PERENNIALS.
3. SEEDING OUTSIDE OF SEEDING DATES RESULTS IN POOR VEGETATION ESTABLISHMENT AND A DECREASE IN PLANT HARDINESS.
4. AN INADEQUATE RATE OF MULCH RESULTS IN POOR GERMINATION AND FAILURE.

TEMPORARY SEEDING SPECIFICATIONS

GENERAL SPECIFICATIONS
1. STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SUCH AS DIVERSIONS AND SEDIMENT TRAPS SHALL BE INSTALLED AND STABILIZED WITH TEMPORARY SEEDING PRIOR TO GRADING THE REST OF THE CONSTRUCTION SITE.
2. TEMPORARY SEED SHALL BE APPLIED ACCORDING TO TABLE 2 TEMPORARY STABILIZATION (SEE SHEET 9).
3. THE SEEDBED SHOULD BE PULVERIZED AND LOOSE TO ENSURE THE SUCCESS OF ESTABLISHING VEGETATION. TEMPORARY SEEDING SHOULD NOT BE POSTPONED IF IDEAL SEEDBED PREPARATION IS NOT POSSIBLE.
4. SOIL AMENDMENTS – TEMPORARY VEGETATION SEEDING RATES SHALL ESTABLISH ADEQUATE STANDS OF VEGETATION, WHICH MAY REQUIRE THE USE OF SOIL AMENDMENTS. BASE RATES FOR LIME AND FERTILIZER SHALL BE USED.
5. SEEDING METHOD – SEED SHALL BE APPLIED UNIFORMLY WITH A CYCLONE SPREADER, DRILL, CULTIPACKER SEEDER, OR HYDROSEEDER. WHEN FEASIBLE, SEED THAT HAS BEEN BROADCAST SHALL BE COVERED BY RAKING OR DRAGGING AND THEN LIGHTLY TAMPED INTO PLACE USING A ROLLER OR CULTIPACKER. IF HYDROSEEDING IS USED, THE SEED AND FERTILIZER WILL BE MIXED ON-SITE AND THE SEEDING SHALL BE DONE IMMEDIATELY AND WITHOUT INTERRUPTION.

MULCHING TEMPORARY SEEDING
1. APPLICATIONS OF TEMPORARY SEEDING SHALL INCLUDE MULCH, WHICH SHALL BE APPLIED DURING OR IMMEDIATELY AFTER SEEDING. SEEDINGS MADE DURING OPTIMUM SEEDING DATES ON FAVORABLE, VERY FLAT SOIL CONDITIONS MAY NOT NEED MULCH TO ACHIEVE ADEQUATE STABILIZATION.
2. MATERIALS:
   - STRAW – IF STRAW IS USED, IT SHALL BE UNROTTED SMALL-GRAIN STRAW APPLIED AT A RATE OF 2 TONS PER ACRE OR 90 LBS/1,000 S.F. (2-3 BALES)
   - HYDROSEEDERS – IF WOOD CELLULOSE FIBER IS USED, IT SHALL BE USED AT 2,000 LBS/ACRE OR 46 LBS/1,000 S.F.
   - OTHER – OTHER ACCEPTABLE MULCHES INCLUDE MULCH MATTINGS APPLIED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS OR WOOD CHIPS APPLIED AT 6 TON/AC.
3. STRAW MULCH SHALL BE ANCHORED IMMEDIATELY TO MINIMIZE LOSS BY WIND OR WATER. ANCHORING METHODS:
   - MECHANICAL – A DISK, CRIMPER, OR SIMILAR TYPE TOOL SHALL BE SET STRAIGHT TO PUNCH OR ANCHOR THE MULCH MATERIAL INTO THE SOIL. STRAW MECHANICALLY ANCHORED SHALL NOT BE FINELY CHOPPED BUT LEFT TO A LENGTH OF APPROXIMATELY 6 INCHES.
   - MULCH NETTING – NETTING SHALL BE USED ACCORDING TO THE MANUFACTURERS RECOMMENDATIONS. NETTING MAY BE NECESSARY TO HOLD MULCH IN PLACE IN AREAS OF CONCENTRATED RUNOFF AND ON CRITICAL SLOPES.
   - SYNTHETIC BINDERS – SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRI-TAC), DCA-70, PETROSET, TERRA TRACK OR EQUIVALENT MAY BE USED AT RATES RECOMMENDED BY THE MANUFACTURER.
   - WOOD-CELLULOSE FIBER – WOOD-CELLULOSE FIBER BINDER SHALL BE APPLIED AT A NET DRY WT. OF 750 LB./AC. THE WOOD-CELLULOSE FIBER SHALL BE MIXED WITH WATER AND THE MIXTURE SHALL CONTAIN A MAXIMUM OF 50 LB. / 100 GAL.

SPECIES SELECTION & APPLICATION RATE
TEMPORARY SEEDING SHALL BE SELECTED AND APPLIED TO REQUIRED AREAS USING THE DATA IN THE TABLE BELOW:

TEMPORARY SEEDING			
SEEDING DATES	SPECIES	SEEDING RATE	
		LBS/1000 S.F.	LBS/ACRE
MARCH 1 TO AUGUST 15	OATS	3.00	128
	TALL FESCUE	1.00	40
	ANNUAL RYEGRASS	1.00	40
	PERENNIAL RYEGRASS	1.00	40
	TALL FESCUE	1.00	40
	ANNUAL RYEGRASS	1.00	40
	ANNUAL RYEGRASS	1.25	55
	PERENNIAL RYEGRASS	3.25	142
	CREEPING RED FESCUE	0.40	17
	KENTUCKY BLUEGRASS	0.40	17
AUGUST 16 TO OCTOBER 31	RYE	3.00	112
	TALL FESCUE	1.00	40
	ANNUAL RYEGRASS	1.00	40
	WHEAT	3.00	120
	TALL FESCUE	1.00	40
	ANNUAL RYEGRASS	1.00	40
	PERENNIAL RYEGRASS	1.00	40
	TALL FESCUE	1.00	40
	ANNUAL RYEGRASS	1.00	40
	ANNUAL RYEGRASS	1.25	40
	PERENNIAL RYEGRASS	3.25	40
	CREEPING RED FESCUE	0.40	40
	KENTUCKY BLUEGRASS	0.40	
NOVEMBER 1 TO FEBRUARY 29	USE MULCH ONLY OR DORMANT SEEDING		
NOTE: OTHER APPROVED SPECIES MAY BE SUBSTITUTED.			

MULCHING

DESCRIPTION
A PROTECTIVE LAYER OF MULCH, USUALLY STRAW, APPLIED TO BARE SOIL IS USED TO ABATE EROSION BY SHIELDING IT FROM RAINDROP IMPACT. MULCH ALSO HELPS ESTABLISH VEGETATION BY CONSERVING MOISTURE AND CREATING FAVORABLE CONDITIONS FOR SEEDS TO GERMINATE.

MULCHING SHOULD BE USED LIBERALLY THROUGHOUT CONSTRUCTION TO LIMIT THE AREAS THAT ARE BARE AND SUSCEPTIBLE TO EROSION. MULCHING CAN BE USED IN CONJUNCTION WITH SEEDING TO ESTABLISH VEGETATION OR BY ITSELF TO PROVIDE EROSION CONTROL WHEN THE SEASON DOES NOT ALLOW GRASS TO GROW.

MAINTENANCE
ADDITIONAL MULCHING IS NECESSARY TO COVER EXPOSED SOIL CONDITIONS WHEN OBSERVED DURING ROUTINE MAINTENANCE INSPECTIONS.

COMMON PROBLEMS/CONCERNS
1. THE APPLICATION OF SYNTHETIC BINDERS MUST BE CONDUCTED IN SUCH A MANNER AS TO NOT BE INTRODUCED INTO WATERCOURSES.
2. WEATHER CONSIDERATIONS MUST BE ADDRESSED TO ENSURE THE APPLICATION OF SYNTHETIC BINDERS ARE NOT WASHED AWAY AND INTRODUCED INTO WATERCOURSES.
3. THE USE OF A MULCH COVER IS NOT RECOMMENDED FOR AREAS, WHICH WILL EXHIBIT HIGHER VELOCITIES THAN 3.5 FEET/SECOND. AN EROSION CONTROL MATTING IS RECOMMENDED FOR AREAS WHICH WILL EXHIBIT HIGHER VELOCITIES.
4. AREAS WHICH HAVE BEEN MULCHED SHOULD BE INSPECTED AND MAINTAINED IF NECESSARY EVERY SEVEN (7) DAYS OR WITHIN TWENTY-FOUR (24) HOURS OF A RAIN EVENT GREATER THAN OR EQUAL TO 0.5 INCHES TO ENSURE ADEQUATE PROTECTION.

PERMANENT SEEDING

DESCRIPTION
PERENNIAL VEGETATION IS ESTABLISHED ON AREAS THAT WILL NOT BE RE-DISTURBED FOR PERIODS LONGER THAN TWELVE (12) MONTHS. PERMANENT SEEDING INCLUDES SITE PREPARATION, SEEDBED PREPARATION, PLANTING SEED, MULCHING, IRRIGATION AND MAINTENANCE.

PERMANENT VEGETATION IS USED TO STABILIZE SOIL, REDUCE EROSION, PREVENT SEDIMENT POLLUTION, REDUCE RUNOFF BY PROMOTING INFILTRATION, AND PROVIDE STORMWATER QUALITY BENEFITS OFFERED BY DENSE GRASS COVER.

VEGETATION CONTROLS EROSION BY REDUCING THE VELOCITY AND THE VOLUME OF OVERLAND FLOW AND PROTECTS BARE SOIL SURFACE FROM RAINDROP IMPACT. A HEALTHY, DENSE TURF PROMOTES INFILTRATION AND REDUCES THE AMOUNT OF RUNOFF. THE ESTABLISHMENT OF QUALITY VEGETATION REQUIRES SELECTION OF THE RIGHT PLANT MATERIALS FOR THE SITE, ADEQUATE SOIL AMENDMENTS, CAREFUL SEEDBED PREPARATION, AND MAINTENANCE.

SOIL COMPACTION
STORM WATER QUALITY AND THE AMOUNT OF RUNOFF BOTH VARY SIGNIFICANTLY WITH SOIL COMPACTION. NON-COMPACTED SOILS IMPROVE STORMWATER INFILTRATION BY PROMOTING DENSE VEGETATIVE GROWTH; HIGH SOIL INFILTRATION & LOWER RUNOFF RATES; POLLUTANT FILTRATION, DEPOSITION & ABSORPTION; AND BENEFICIAL BIOLOGIC ACTIVITY IN THE SOIL.

CONSTRUCTION ACTIVITY CREATES HIGHLY COMPACTED SOILS THAT RESTRICT WATER INFILTRATION AND ROOT GROWTH. THE BEST TIME FOR IMPROVING SOIL CONDITION IS DURING THE ESTABLISHMENT OF PERMANENT VEGETATION. IT IS HIGHLY RECOMMENDED THAT SUBSOILERS, PLOWS, OR OTHER IMPLEMENTS ARE SPECIFIED AS PART OF FINAL SEEDBED PREPARATION. USE DISCRETION IN SLIP-PRONE AREAS.

MINIMUM SOIL CONDITIONS
VEGETATION CANNOT BE EXPECTED TO STABILIZE SOIL THAT IS UNSTABLE DUE TO ITS TEXTURE, STRUCTURE, WATER MOVEMENT OR EXCESSIVELY STEEP SLOPE. THE FOLLOWING MINIMUM SOIL CONDITIONS ARE NEEDED FOR THE ESTABLISHMENT AND MAINTENANCE OF A LONG-LIVED VEGETATIVE COVER. IF THESE CONDITIONS CANNOT BE MET, SEE THE STANDARDS AND SPECIFICATIONS FOR TOPSOILING.
1. SOILS MUST INCLUDE ENOUGH FINE-GRAINED MATERIAL TO HOLD AT LEAST A MODERATE AMOUNT OF AVAILABLE MOISTURE.
2. THE SOIL MUST BE FREE FROM MATERIAL THAT IS TOXIC OR OTHERWISE HARMFUL TO PLANT GROWTH.

MAINTENANCE
1. EXPECT EMERGENCE WITHIN FOUR (4) TO TWENTY-EIGHT (28) DAYS AFTER SEEDING, WITH LEGUMES TYPICALLY FOLLOWING GRASSES. CHECK PERMANENT SEEDLINGS WITHIN FOUR (4) TO SIX (6) WEEKS AFTER PLANTING, LOOKING FOR:
   - VIGOROUS SEEDLINGS
   - UNIFORM GROUND SURFACE COVERAGE WITH AT LEAST 30% GROWTH DENSITY
   - UNIFORMITY WITH LEGUMES AND GRASSES WELL INTERMIXED
   - GREEN, NOT YELLOW, LEAVES. PERENNIALS SHOULD REMAIN GREEN THROUGHOUT THE SUMMER, AT LEAST AT THE PLANT BASES
2. PERMANENT SEEDING SHALL NOT BE CONSIDERED ESTABLISHED FOR AT LEAST ONE (1) FULL YEAR FROM THE TIME OF PLANTING. INSPECT THE SEEDING FOR SOIL EROSION OR PLANT LOSS DURING THIS FIRST YEAR. REPAIR BARE AND SPARSE AREAS. FILL GULLIES. RE-FERTILIZE, RE-SEED, AND RE-MULCH IF REQUIRED. CONSIDER NO-TILL PLANTING. A MINIMUM OF 70% GROWTH DENSITY, BASED ON A VISUAL INSPECTION, MUST EXIST FOR AN ADEQUATE PERMANENT VEGETATIVE PLANTING.
   - IF STAND IS INADEQUATE OR PLANT COVER IS PATCHY, IDENTIFY THE CAUSE OF FAILURE AND TAKE CORRECTIVE ACTION: CHOICE OF PLANT MATERIALS, LIME AND FERTILIZER QUANTITIES, POOR SEEDBED PREPARATION, OR WEATHER. IF VEGETATION FAILS TO GROW, HAVE THE SOIL TESTED TO DETERMINE WHETHER PH IS IN THE CORRECT RANGE OR NUTRIENT DEFICIENCY IS A PROBLEM.
   - DEPENDING ON STAND CONDITIONS, REPAIR WITH COMPLETE SEEDBED PREPARATION, THEN OVER-SEED OR RE-SEED.
   - IF IT IS THE WRONG TIME OF YEAR TO PLANT DESIRED SPECIES, OVER-SEED WITH SMALL GRAIN COVER CROP TO THICKEN THE STAND UNTIL TIMING IS RIGHT TO PLANT PERENNIALS OR USE TEMPORARY SEEDING.
3. SATISFACTORY ESTABLISHMENT MAY REQUIRE RE-FERTILIZING THE STAND IN THE SECOND GROWING SEASON.
   - DO NOT FERTILIZE COOL SEASON GRASSES IN LATE MAY THROUGH JULY (I.E. KENTUCKY BLUEGRASS, ORCHARDGRASS, PERRENIAL RYEGRASS, SMOOTH BROME, FESCUES, TIMOTHY, REED CANARYGRASS AND GARRISON GRASS)
   - GRASS THAT LOOKS YELLOW MAY BE NITROGEN DEFICIENT. IN LIEU OF A SOIL TEST, AN APPLICATION OF 50 LBS OF N-P-K PER ACRE IN EARLY SPRING WILL HELP COOL SEASON GRASSES COMPETE AGAINST WEEDS OR GROW MORE SUCCESSFULLY
   - DO NOT USE NITROGEN FERTILIZER IF THE STAND CONTAINS MORE THAN 20 PERCENT LEGUMES
4. CONSIDER MOWING AFTER PLANTS REACH A HEIGHT OF SIX (6) TO EIGHT (8) INCHES. MOW GRASSES TALL, AT LEAST THREE (3) INCHES IN HEIGHT AND MINIMIZE COMPACTION DURING THE MOWING PROCESS. VEGETATION ON STRUCTURAL PRACTICES SUCH AS EMBANKMENTS AND GRASS-LINED CHANNELS NEED TO BE MOWED ONLY TO PREVENT WOODY PLANTS FROM INVADING THE STAND.

COMMON PROBLEMS/CONCERNS
1. INSUFFICIENT TOPSOIL OR INADEQUATELY TILLED, LIMED, AND/OR FERTILIZED SEEDBED – RESULTS IN POOR ESTABLISHMENT OF VEGETATION.
2. UNSUITABLE SPECIES OR SEEDING MIXTURE – RESULTS IN COMPETITION WITH THE PERENNIALS.
3. NURSE CROP RATE TOO HIGH IN THE MIXTURE – RESULTS IN COMPETITION WITH THE PERENNIALS.
4. SEEDING DONE AT THE WRONG TIME OF YEAR – RESULTS IN POOR ESTABLISHMENT OF VEGETATION, ALSO PLANT HARDINESS IS SIGNIFICANTLY DECREASED.
5. MULCH RATE INADEQUATE – RESULTS IN POOR GERMINATION AND FAILURE.

PERMANENT SEEDING SPECIFICATIONS

GENERAL SPECIFICATIONS
PERMANENT SEED SHALL BE APPLIED ACCORDING TO TABLE 1 PERMANENT STABILIZATION (SEE SHEET 9)

SITE PREPARATION
1. SUBSOILER, PLOW, OR OTHER IMPLEMENT SHALL BE USED TO REDUCE SOIL COMPACTION AND ALLOW MAXIMUM INFILTRATION. MAXIMIZING INFILTRATION WILL HELP CONTROL BOTH RUNOFF RATE AND WATER QUALITY. SUBSOILING SHOULD BE DONE WHEN THE SOIL MOISTURE IS LOW ENOUGH TO ALLOW THE SOIL TO CRACK OR FRACTURE. SUBSOILING SHALL NOT BE DONE ON SLIP-PRONE AREAS WHERE SOIL PREPARATION SHOULD BE LIMITED TO WHAT IS NECESSARY FOR ESTABLISHING VEGETATION.
2. THE SITE SHALL BE GRADED AS NEEDED TO PERMIT THE USE OF CONVENTIONAL EQUIPMENT FOR SEEDBED PREPARATION AND SEEDING.
3. TOPSOIL SHALL BE APPLIED WHERE NEEDED TO ESTABLISH VEGETATION.

SEEDBED PREPARATION
1. LIME – AGRICULTURAL GROUND LIMESTONE SHALL BE APPLIED TO ACID SOIL AS RECOMMENDED BY A SOIL TEST. IN LIEU OF A SOIL TEST, LIME SHALL BE APPLIED AT THE RATE OF 100 POUNDS PER 1,000-SQ. FT. OR 2 TONS PER ACRE.
2. FERTILIZER – FERTILIZER SHALL BE APPLIED AS RECOMMENDED BY A SOIL TEST. IN PLACE OF A SOIL TEST, FERTILIZER SHALL BE APPLIED AT A RATE OF 25 POUNDS PER 1,000-SQ. FT. OR 1000 POUNDS PER ACRE OF A 10-10-10 OR 12-12-12 ANALYSES.
3. THE LIME AND FERTILIZER SHALL BE WORKED INTO THE SOIL WITH A DISK HARROW, SPRING-TOOTH HARROW, OR OTHER SUITABLE FIELD IMPLEMENT TO A DEPTH OF 3 INCHES. ON SLOPING LAND, THE SOIL SHALL BE WORKED ON THE CONTOUR.

SEEDING DATES AND SOIL CONDITIONS
SEEDING SHOULD BE DONE MARCH 1 TO MAY 31 OR AUGUST 1 TO SEPTEMBER 30. IF SEEDING OCCURS OUTSIDE OF THE ABOVE-SPECIFIED DATES, ADDITIONAL MULCH AND IRRIGATION MAY BE REQUIRED TO ENSURE A MINIMUM OF 80% GERMINATION. TILLAGE FOR SEEDBED PREPARATION SHOULD BE DONE WHEN THE SOIL IS DRY ENOUGH TO CRUMBLE AND NOT FORM RIBBONS WHEN COMPRESSED BY HAND. FOR WINTER SEEDING, SEE THE FOLLOWING SECTION ON DORMANT SEEDING.

DORMANT SEEDINGS
1. SEEDINGS SHOULD NOT BE MADE FROM OCTOBER 1 THROUGH NOVEMBER 20. DURING THIS PERIOD, THE SEEDS ARE LIKELY TO GERMINATE BUT PROBABLY WILL NOT BE ABLE TO SURVIVE THE WINTER.
2. THE FOLLOWING METHODS MAY BE USED FOR "DORMANT SEEDING":
   - FROM OCTOBER 1 THROUGH NOVEMBER 20, PREPARE THE SEEDBED, ADD THE REQUIRED AMOUNTS OF LIME AND FERTILIZER, THEN MULCH AND ANCHOR. AFTER NOVEMBER 20, AND BEFORE MARCH 15, BROADCAST THE SELECTED SEED MIXTURE. INCREASE THE SEEDING RATES BY 50% FOR THIS TYPE OF SEEDING.
   - FROM NOVEMBER 20 THROUGH MARCH 15, WHEN SOIL CONDITIONS PERMIT, PREPARE THE SEEDBED, LIME AND FERTILIZE, APPLY THE SELECTED SEED MIXTURE, MULCH AND ANCHOR. INCREASE THE SEEDING RATES BY 50% FOR THIS TYPE OF SEEDING.
   - APPLY SEED UNIFORMLY WITH A CYCLONE SEEDER, DRILL, CULTIPACKER SEEDER, OR HYDRO-SEEDER (SLURRY MAY INCLUDE SEED AND FERTILIZER) ON A FIRM, MOIST SEEDBED.
   - WHERE FEASIBLE, EXCEPT WHEN A CULTIPACKER TYPE SEEDER IS USED, THE SEEDBED SHOULD BE FIRMED FOLLOWING SEEDING OPERATIONS WITH A CULTIPACKER, ROLLER, OR LIGHT DRAG. ON SLOPING LAND, SEEDING OPERATIONS SHOULD BE ON THE CONTOUR WHERE FEASIBLE.

MULCHING
1. MULCH MATERIAL SHALL BE APPLIED IMMEDIATELY AFTER SEEDING. DORMANT SEEDING SHALL BE MULCHED. 100% OF THE GROUND SURFACE SHALL BE COVERED WITH AN APPROVED MATERIAL.
2. MATERIALS
   - STRAW – IF STRAW IS USED IT SHALL BE UNROTTED SMALL-GRAIN STRAW APPLIED AT THE RATE OF 2 TONS PER ACRE OR 90 POUNDS (TWO TO THREE BALES) PER 1,000 S.F. THE MULCH SHALL BE SPREAD UNIFORMLY BY HAND OR MECHANICALLY APPLIED SO THE SOIL SURFACE IS COVERED. FOR UNIFORM DISTRIBUTION OF HAND-SPREAD MULCH, DIVIDE AREA INTO APPROXIMATELY 1,000-SQ.-FT. SECTIONS AND SPREAD TWO 45-LB. BALES OF STRAW IN EACH SECTION
   - HYDROSEEDERS – IF WOOD CELLULOSE FIBER IS USED, IT SHALL BE APPLIED AT 2,000 LBS/ACRE OR 46 LBS/1,000 S.F.
   - OTHER – OTHER ACCEPTABLE MULCHES INCLUDE ROLLED EROSION CONTROL MATTINGS OR BLANKETS APPLIED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS OR WOOD CHIPS APPLIED AT 6 TONS PER ACRE.
3. STRAW AND MULCH ANCHORING METHODS – STRAW MULCH SHALL BE ANCHORED IMMEDIATELY TO MINIMIZE LOSS BY WIND OR WATER.
   - MECHANICAL – A DISK, CRIMPER, OR SIMILAR TYPE TOOL SHALL BE SET STRAIGHT TO PUNCH OR ANCHOR THE MULCH MATERIAL INTO THE SOIL. STRAW MECHANICALLY ANCHORED SHALL NOT BE FINELY CHOPPED BUT, GENERALLY, BE LEFT LONGER THAN SIX (6) INCHES

REVISION		
#	BY	DATE

CHANGE ORDER SCHEDULE

#	DESCRIPTION OF CHANGE

TerrainEvolution
Your bridge between Vision and Success
720 East Broad Street | Suite 203 | Columbus, OH 43215
P: 614.385.1090 | F: 614.385.1085 | E: info@terrainevolution.com

BERKSHIRE TOWNSHIP, DELAWARE COUNTY, OHIO
BERKSHIRE TOWNSHIP RECREATIONAL COURTS
1454 ROME CORNERS ROAD

STORMWATER POLLUTION PREVENTION NOTES

DRAWING SET STATUS:
- ☐ PRELIMINARY ENGINEERING SET
- ☐ AGENCY REVIEW SET
- ■ CONSTRUCTION DOCUMENT SET
- ☐ AS-BUILT DOCUMENT SET

DESIGN	DRAFT	CHECK
DGR	DGR	MSW

PROJECT NO.: 25-002
DATE: MARCH, 2025
SCALE:
HORIZONTAL: N/A
VERTICAL: N/A

SHEET NO.: 8 / 10

PERMANENT SEEDING (CONT'D)

- MULCH NETTING – NETTING SHALL BE USED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. NETTING MAY BE NECESSARY TO HOLD MULCH IN PLACE IN AREAS OF CONCENTRATED RUNOFF AND ON CRITICAL SLOPES
- ASPHALT EMULSION – ASPHALT SHALL BE APPLIED AS RECOMMENDED BY THE MANUFACTURER OR AT THE RATE OF 160 GALLONS PER ACRE
- SYNTHETIC BINDERS – SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRI-TAC), DCA-70, PETROSET, TERRA TACK OR EQUIVALENT MAY BE USED AT RATES SPECIFIED BY THE MANUFACTURER
- WOOD CELLULOSE FIBER – WOOD CELLULOSE FIBER SHALL BE APPLIED AT A NET DRY WEIGHT OF 750 POUNDS PER ACRE. THE WOOD CELLULOSE FIBER SHALL BE MIXED WITH WATER WITH THE MIXTURE CONTAINING A MAXIMUM OF 50 POUNDS CELLULOSE PER 100 GALLONS OF WATER.

IRRIGATION
PERMANENT SEEDING SHALL INCLUDE IRRIGATION TO ESTABLISH VEGETATION DURING DRY WEATHER OR ON ADVERSE SITE CONDITIONS, WHICH REQUIRE ADEQUATE MOISTURE FOR SEED GERMINATION AND PLANT GROWTH.

IRRIGATION RATES SHALL BE MONITORED TO PREVENT EROSION AND DAM\FS20 AGE TO SEEDED AREAS FROM EXCESSIVE RUNOFF

SPECIES SELECTION & APPLICATION RATE
PERMANENT SEEDING SHALL BE SELECTED AND APPLIED TO REQUIRED AREAS USING THE DATA IN THE TABLE BELOW:

PERMANENT SEEDING			
SEED MIX	SEEDING RATE		NOTES
	LBS/ACRE	LBS/1000 S.F.	
GENERAL USE			
CREEPING RED FESCUE	20–40	0.50–1.00	FOR CLOSE MOWING & FOR WATERWAYS WITH VELOCITY < 2.0 FT/SEC
DOMESTIC RYEGRASS	10–20	0.25–0.50	
KENTUCKY BLUEGRASS	20–40	0.50–1.00	
TALL FESCUE	40–50	1.00–1.25	
TURF-TYPE (DWARF) FESCUE	90	2.25	
STEEP BANKS OR CUT SLOPES			
TALL FESCUE	40–50	1.25	
CROWN VETCH	10–20	3.25	DO NOT SEED LATER THAN AUGUST
TALL FESCUE	20–30	0.40	
FLAT PEA	20–25	3.25	DO NOT SEED LATER THAN AUGUST
TALL FESCUE	20–30	0.40	
ROAD DITCHES AND SWALES			
TALL FESCUE	40–50	1.25	
TURF-TYPE (DWARF) FESCUE	90	3.25	
TALL FESCUE	5	1.00	
LAWNS			
KENTUCKY BLUEGRASS	100–120	2.00	
PERENNIAL RYEGRASS		2.00	
KENTUCKY BLUEGRASS	100–120	2.00	FOR SHADED AREAS
CREEPING RED FESCUE		1.00–1.50	
NOTE: OTHER APPROVED SPECIES MAY BE SUBSTITUTED.			

ROCK CHECK DAMS

DESCRIPTION
CHECK DAMS ARE SMALL ROCK DAMS CONSTRUCTED IN SWALES, GRASSED WATERWAYS OR DIVERSIONS. THEY REDUCE THE VELOCITY OF CONCENTRATED FLOWS, THEREBY REDUCING EROSION WITHIN THE SWALE OR WATERWAY. WHILE THIS PRACTICE OFTEN TRAPS SOME SEDIMENT, ITS TRAPPING EFFICIENCY IS EXTREMELY POOR, THUS, IT SHOULD NOT BE USED AS A PRIMARY SEDIMENT-TRAPPING PRACTICE.

THIS PRACTICE IS LIMITED TO USE IN SMALL OPEN CHANNELS WHERE IT IS NECESSARY TO SLOW THE VELOCITY OF FLOWS IN ORDER TO PREVENT EROSION. APPLICATIONS INCLUDE TEMPORARY SWALES WHICH, BECAUSE OF THEIR SHORT LENGTH OF SERVICE, ARE NOT PRACTICAL TO RECEIVE A NON-ERODIBLE LINING OR SWALES WHICH NEED PROTECTION DURING THE ESTABLISHMENT OF GRASS LININGS. THIS PRACTICE IS LIMITED TO SMALL, OPEN CHANNELS WITH A DRAINAGE AREA LESS THAN TEN (10) ACRES WITH THE OBJECT TO PROTECT LIVE STREAMS.

PLANNING CONSIDERATIONS
ROCK CHECK DAMS ARE PREFERRED OVER STRAW BALE DAMS FOR THEIR EFFECTIVENESS AT FILTRATION AND MINIMAL MAINTENANCE REQUIREMENTS.

ROCK CHECK DAMS SHALL BE PLACED WHERE STANDING WATER OR EXCESSIVE SILTATION ARE MINIMIZED OR WHERE VEGETATIVE LINING DEATH IS INSIGNIFICANT.

ROCK CHECK DAMS SHOULD BE CONSIDERED WHERE THE DITCH OR SWALE WILL NOT BE MOWED AFTER CONSTRUCTION IS COMPLETE.

DESIGN CRITERIA
FOR INCREASED SEDIMENT CONTROL SMALLER AGGREGATE AND OR FILTER FABRIC ON THE UPSTREAM SIDE MAY BE USED. ALTHOUGH, IT SHOULD BE NOTED THAT INCREASED PONDING AND THE SUBSEQUENT INCREASE IN HEIGHT OF WATER BEHIND THE CHECK DAM RAISES THE EROSION POTENTIAL DOWNSTREAM. SEE THE DETAIL & SPECIFICATIONS (INCLUDED IN THESE PLANS) FOR ADDITIONAL DESIGN GUIDELINES.

MAINTENANCE
SEDIMENT SHALL BE REMOVED FROM BEHIND THE CHECK DAM ONCE IT ACCUMULATES TO ONE-HALF OF THE ORIGINAL HEIGHT OF THE CHECK DAM.

REMOVAL
REMOVAL OF THE CHECK DAM CAN BE PERFORMED BY HAND OR MECHANICAL MEANS. STONE AND SEDIMENT SHOULD BE REMOVED AND THE AREA GRADED AND SEEDED.

COMMON PROBLEMS/CONCERNS
1. IF THE SWALE/DITCH IS TO BE MOWED, THE ROCKS THAT REMAIN (AFTER REMOVAL OF THE CHECK DAM) MAY POSE A SAFETY OR MAINTENANCE PROBLEM.

SLOPE DRAINS

DESCRIPTION
A PIPE OR CHUTE PLACED ON A SLOPE TO CONVEY SURFACE RUNOFF DOWNSLOPE WITHOUT CAUSING EROSION. SLOPE DRAINS PROVIDE A TEMPORARY OUTLET FOR EITHER A DIVERSION OR TERRACED SLOPE.

SLOPE DRAINS ARE USED WHEREVER A TEMPORARY OUTLET IS NEEDED FOR A DIVERSION, TERRACE OR EMBANKMENT. SLOPE DRAINS ARE USEFUL ALONG ROAD FILLS OR OTHER LONG FILLS WHERE SURFACE FLOW DOWN THE EMBANKMENT WOULD CAUSE SIGNIFICANT DAMAGE. THIS PRACTICE MAY BE NECESSARY WHERE DRAINAGE CANNOT EASILY BE DIRECTED TO THE ENDS OF A SECTION OF FILL. THE MAXIMUM ALLOWABLE DRAINAGE AREA FOR THIS PRACTICE IS 5 ACRES.

DESIGN CRITERIA
THE SLOPE DRAIN SHALL BE DESIGNED FOR NON-PRESSURE FLOW, AND A MINIMUM 10 YEAR FREQUENCY EVENT. THE INLET SHALL BE PROTECTED FROM SCOURING. IN LIEU OF DESIGN COMPUTATIONS, THE FOLLOWING TABLE MAY BE USED FOR SIZING THE DRAIN:

SLOPE DRAIN SIZING	
PIPE DIAMETER (INCHES)	MAXIMUM DRAINAGE AREA (ACRES)
12	0.50
18	1.50
21	2.50
24	3.50

OUTLET – WHEN THE DRAINAGE AREA IS DISTURBED, THE SLOPE DRAIN SHALL EITHER HAVE INLET PROTECTION, OR THE DRAIN OUTLET SHALL BE DIRECTED INTO A SEDIMENT TRAPPING DEVICE. A HARD ARMORED APRON SHALL BE PROVIDED BELOW THE OUTLET WHERE CLEAN WATER IS DISCHARGED INTO A STABILIZED AREA OR CHANNEL.

SPECIFICATIONS
1. THE SLOPE DRAIN SHALL BE CONSTRUCTED ON A MINIMUM SLOPE OF 3 PERCENT.
2. ALL POINTS ALONG THE TOP OF THE DIKE/EARTHFILL FOR THE STORAGE AREA SHALL BE AT LEAST ONE (1) FOOT HIGHER THAN THE TOP OF THE INLET PIPE.
3. THE PIPE DRAIN MAY BE CONSTRUCTED OF CORRUGATED METAL OR PVC PIPE. ALL PIPE CONNECTIONS SHALL BE WATERTIGHT. FLEXIBLE TUBING MAY BE USED, PROVIDED RIGID PIPE IS USED FOR THE INLET, THE FLEXIBLE TUBING IS OF THE SAME DIAMETER AS THE INLET, AND PIPE CONNECTIONS ARE MADE WITH METAL STRAPPING OR WATERTIGHT CONNECTING COLLARS. THE FLEXIBLE PIPE SHALL BE CONSTRUCTED WITH HOLD DOWN APPARATUS SPACED ON 10 FOOT CENTERS FOR ANCHORING THE PIPE.
4. THE ENTRANCE TO THE PIPE SHALL BE A HOODED TYPE.
5. THE SOIL AROUND AND/OR UNDER THE PIPE SHALL BE PLACED IN FOUR (4) INCH LAYERS AND HAND COMPACTED TO THE TOP OF THE EARTH DIKE.
6. A RIPRAP APRON SHALL BE INSTALLED AT THE PIPE OUTLET WHERE CLEAN WATER IS DISCHARGED INTO A STABILIZED AREA OR DRAINAGEWAY.

COMMON PROBLEMS/CONCERNS
1. PIPING OF SOIL MATERIAL APPEARS AROUND THE PIPE OUTLET – CARE SHOULD BE TAKEN TO ADEQUATELY COMPACT THE FILL MATERIAL AROUND AND BENEATH THE PIPE STRUCTURE TO PREVENT THE FLOW OF WATER.
2. SCOURING OF FILL MATERIAL OCCURS AROUND THE PIPE ENTRANCE – A VORTEX MAY OCCUR AT THE PIPE ENTRANCE DURING HIGH FLOW CONDITIONS. ARMORING OF THE ENTRANCE OR THE INSTALLATION OF AN ANTI-VORTEX DEVICE MAY BE NECESSARY TO PREVENT THE FAILURE OF THE EARTH FILL/DIKE

TEMPORARY DIVERSION

DESCRIPTION
A TEMPORARY DIVERSION IS A DIKE AND/OR CHANNEL CONSTRUCTED TO:
1. DIRECT SEDIMENT-LADEN RUNOFF TO A SETTLING BASIN
2. ROUTE CLEAN RUNOFF AWAY FROM DISTURBED AREAS
3. DIVERT RUNOFF TO REDUCE THE EFFECTIVE LENGTH OF THE SLOPE
4. DIRECT RUNOFF AWAY FROM STEEP CUT OR FILL SLOPES

THIS PRACTICE APPLIES TO CONSTRUCTION AREAS WHERE RUNOFF MUST BE REDIRECTED IN ORDER TO PREVENT OFFSITE SEDIMENTATION, EROSION OR FLOODING OF WORK AREAS. TEMPORARY DIVERSIONS ARE PARTICULARLY APPLICABLE TO PREVENT FLOW FROM DAMAGING ERODIBLE OR UNSTABLE AREAS.

TEMPORARY DIVERSIONS ARE APPROPRIATE FOR DRAINAGE AREAS LESS THEN 10 ACRES.

PLANNING CONSIDERATIONS
IT IS IMPORTANT THAT DIVERSIONS ARE PROPERLY DESIGNED, CONSTRUCTED, AND MAINTAINED SINCE THEY CONCENTRATE WATER FLOW AND MAY INCREASE EROSION POTENTIAL. PARTICULAR CARE MUST BE TAKEN IN PLANNING DIVERSION GRADES. TOO MUCH SLOPE CAN RESULT IN EROSION IN THE DIVERSION CHANNEL OR AT THE OUTLET. A CHANGE OF SLOPE FROM A STEEPER GRADE TO A FLATTER MAY CAUSE DEPOSITION TO OCCUR, REDUCING CARRYING CAPACITY, AND INCREASING CHANCES OF OVERTOPPING & FAILURE.

DESIGN CRITERIA
IT IS USUALLY LESS COSTLY TO EXCAVATE A CHANNEL AND FORM A DIKE USING THE SPOILS THAN TO BUILD DIVERSIONS BY OTHER METHODS. WHERE SPACE IS LIMITED, IT MAY BE NECESSARY TO BUILD THE DIKE BY HAULING IN DIKING MATERIAL. USE GRAVEL TO ARMOR THE DIVERSION DIKE WHERE VEHICLES MUST CROSS FREQUENTLY.

BUILD AND STABILIZE DIVERSIONS AND OUTLETS OR DOWNSTREAM SEDIMENT FACILITIES BEFORE INITIATING OTHER LAND-DISTURBING ACTIVITIES.

THESE STRUCTURES GENERALLY HAVE A LIFE EXPECTANCY OF 18MONTHS OR LESS, BUT CAN BE PROLONGED WITH PROPER MAINTENANCE.

SEE THE DETAIL & SPECIFICATIONS (INCLUDED IN THESE PLANS) FOR ADDITIONAL DESIGN GUIDELINES.

MAINTENANCE
INSPECT TEMPORARY DIVERSIONS ONCE A WEEK AND AFTER EVERY STORM EVENT. IMMEDIATELY REMOVE SEDIMENT FROM THE FLOW AREA AND REPAIR THE DIVERSION DIKE AS NEEDED. CAREFULLY CHECK OUTLETS AND MAKE NECESSARY REPAIRS IMMEDIATELY.

WHEN THE AREA PROTECTED IS PERMANENTLY STABILIZED, REMOVE THE DIKE AND THE CHANNEL TO BLEND WITH THE NATURAL GROUND LEVEL AND STABILIZE ALL DISTURBED AREAS WITH VEGETATION OR OTHER EROSION CONTROL PRACTICE.

COMMON PROBLEMS/CONCERNS
1. SEDIMENTATION RESULTS IN CHANNEL GRADE DECREASING OR REVERSING, LEADING TO OVERTOPPING – REALIGN OR DEEPEN THE CHANNEL TO MAINTAIN GRADE
2. LOW POINT IN DIKE WHERE DIVERSION CROSSES A NATURAL DEPRESSION RESULTS IN OVERTOPPING OF THE DIKE – BUILD UP THE DIKE.
3. EROSION IN CHANNEL BEFORE VEGETATION IS ESTABLISHED RESULTS IN UNEVEN CHANNEL GRADE, MAY LEAD TO BREACH OF DIKE – REPAIR CHANNEL AND INSTALL SOD OR SYNTHETIC LINER.
4. IF SEEPAGE OR POOR DRAINAGE IN CHANNEL RESULTS IN POOR VEGETATION ESTABLISHMENT, IT MAY BE NECESSARY TO RE-GRADE IN ORDER TO CREATE POSITIVE DRAINAGE OR TO INSTALL SUBSURFACE DRAINS OR STONE CHANNEL BOTTOM.
5. VEHICLE CROSSINGS RESULT IN RUTTING AND INCREASED EROSION – MAINTAIN THE DIKE HEIGHT, FLATTEN THE SIDE SLOPES, PROTECT THE DIKE WITH GRAVEL OR HARD SURFACE AT THE CROSSING POINT.
6. EXCESSIVE VELOCITY AT THE OUTLET RESULTS IN EROSION – INSTALL OR REPAIR ROCK OUTLET PROTECTION.
7. EXCESSIVE GRADE IN CHANNEL RESULTS IN GULLY EROSION – REPAIRS CHANNEL, AND INSTALL AN EROSION RESISTANT LINING OR REALIGN TO REDUCE THE GRADE.

DEWATERING MEASURES

DESCRIPTION
DEWATERING MEASURES PROVIDE A STABLE AREA FOR RECEIVING AND TREATING WATER PUMPED FROM EXCAVATION OR WORK AREAS PRIOR TO BEING RELEASED OFF THE SITE. THESE PRACTICES REDUCE SEDIMENT IMPACTS TO DOWNSTREAM WATER RESOURCES.

DEWATERING MEASURES ARE USED WHENEVER WATER, EITHER SURFACE OR SUBSURFACE, PREVENTS OR HINDERS CONSTRUCTION ACTIVITIES AND HAS THE POTENTIAL OF CONTRIBUTING SEDIMENT TO STREAMS. THIS PRACTICE IS APPROPRIATE FOR ANY KIND OF PUMPING USED IN CONJUNCTION WITH CONSTRUCTION ACTIVITIES.

PLANNING CONSIDERATIONS
CONSTRUCTION ACTIVITIES OFTEN REQUIRE THAT WATER BE PUMPED FROM AN AREA TO FACILITATE WORK. THIS WATER OFTEN HAS LARGE AMOUNTS OF SUSPENDED SEDIMENTS. RATHER THAN DISCHARGE THIS WATER DIRECTLY TO A STREAM, A MEANS TO SETTLE OR REMOVE SEDIMENT MUST BE PROVIDED.

A DEWATERING PLAN SHOULD BE PREPARED UTILIZING GROUND WATER CONDITIONS AND SOILS INFORMATION TO PREDICT AREAS WHERE DEWATERING WILL LIKELY OCCUR. PLANS SHOULD INCLUDE THE LENGTH OF TIME DEWATERING WILL OCCUR, THE METHOD OF DEWATERING (PUMPING, SIPHON, ETC.), THE DISCHARGE POINT(S), METHODS TO CONTROL SEDIMENT IMPACTS AND THE CONTENTS OF A WRITTEN LOG TO BE KEPT ON-SITE. THESE PLANS MAY NEED TO BE APPROVED BY LOCAL AUTHORITIES PRIOR TO CONSTRUCTION.

ALL DEWATERING DISCHARGES WITH SUSPENDED SOLIDS SHOULD PASS THROUGH A PRACTICE TO REMOVE SEDIMENTS. WHILE VEGETATED FILTER AREAS MAY BE SUFFICIENT FOR SOME SITUATIONS (E.G. SHORT DURATION LOW PUMPING RATES) MANY WILL NEED ADDITIONAL MEASURES, SUCH AS SEDIMENT TRAPS, FILTER BAG OR FLOCCULATION. ALL STRUCTURES MUST HAVE ADEQUATE OUTLET PROTECTION TO PREVENT GULLY EROSION. PLEASE NOTE THAT THE OHIO ENVIRONMENTAL PROTECTION AGENCY WILL FIND TURBID DISCHARGES TO THE STREAM RESULTING FROM ANY DEWATERING ACTIVITY A VIOLATION OF OHIO REVISED CODE 6111.04 INDEPENDENT OF THE METHODS EMPLOYED. THEREFORE EVEN IF ONE METHOD IS SELECTED, ADDITIONAL MEASURES MAY BE REQUIRED TO FULLY TREAT TURBID WATER.

THE PARTICLE SIZE DISTRIBUTION, THAT IS THE RELATIVE PROPORTION OF SANDS, SILTS AND CLAYS, OF A SOIL THAT IS SUSPENDED WILL DETERMINE THE DIFFICULTY OF REMOVING SEDIMENTS. SOILS WITH COARSER PARTICLE SIZE DISTRIBUTIONS (LARGE PROPORTION OF SAND) WILL BE EASIER TO SETTLE OUT WITH FILTER STRIPS AND SETTLING PONDS. FINER PARTICLE SIZE DISTRIBUTIONS (PREDOMINANTLY SILT AND CLAYS) WILL BE INCREASINGLY DIFFICULT AND MAY NEED A SERIES OF MEASURES.

GROUND WATER LOWERING – OFTEN DEWATERING WELLS ARE ESTABLISHED TO LOWER THE GROUND WATER TABLE FOR UTILITY INSTALLATION OR CONSTRUCTION. GENERALLY, THIS WATER IS FREE FROM SUSPENDED SOLIDS AND MAY BE DISCHARGED TO WATERS OF THE STATE PROVIDED THE WATER IS NOT CONTAMINATED.

MEASURES SHOULD BE TAKEN TO ENSURE THE DISCHARGE FROM THE DEWATERING WELLS DOES NOT FLOW OVER DISTURBED AREAS AND SUSPEND SEDIMENTS, RESULTING IN CONTAMINATED DISCHARGE. WATERWAYS ESTABLISHED TO TRANSPORT DEWATERING FLOW SHOULD BE PROTECTED FROM EROSION FROM THE POINT OF DISCHARGE ALL THE WAY TO WATERS OF THE STATE. EXTENDING HOSES TO WATERS OF THE STATE WILL ENSURE THE DISCHARGE REMAINS FREE FROM SUSPENDED SOLIDS. THIS PRACTICE IS RECOMMENDED FOR DISCHARGES OF SHORT DURATION.

WATER PUMPED FROM WELLS IS ABOUT 55°F, WHICH MAY CAUSE THERMAL IMPACTS IN SOME SITUATIONS. HIGH PUMPING RATES NEAR SMALL STREAMS IN SUMMER WILL HAVE MAJOR CHANGES IN STREAM METABOLISM, I.E., THROW OFF SPAWNING. WHERE THIS POTENTIAL OCCURS, GROUNDWATER SHOULD NOT BE DISCHARGED DIRECTLY TO THE STREAM BUT ROUGHED THROUGH SETTLING PONDS OR OTHER SHALLOW HOLDING PONDS.

THE OHIO DEPARTMENT OF NATURAL RESOURCES, DIVISION OF WATER, REQUIRES A WATER WITHDRAW REGISTRATION FOR THE DEWATERING ACTIVITIES IN THE EVENT THE FACILITY HAS THE CAPACITY OF PUMPING IN EXCESS OF 100,000 GALLONS PER DAY. THIS REGISTRATION MUST BE SUBMITTED TO ODNR WITHIN 90 DAYS FOLLOWING THE COMPLETION OF THE PROJECT. A WATER WITHDRAW REGISTRATION CAN BE OBTAINED BY CONTACTING ODNR, DIVISION OF WATER, AT 614-265-6735. ASSISTANCE REGARDING PROPER WELL INSTALLATION AND ABANDONMENT IS ALSO AVAILABLE.

DESIGN CRITERIA
VEGETATED FILTER AREAS – DENSELY VEGETATED AREAS MAY OFFER SUFFICIENT CONDITIONS TO TREAT SHORT DURATION DISCHARGES PROVIDED THAT: FLOW IS NOT CHANNELIZED DIRECTLY TO A WATER RESOURCE AND THE AREA ENCOURAGES INFILTRATION, SLOW OVERLAND FLOW AND SETTLING. A MINIMUM OF 100 FEET IS REQUIRED TO UTILIZE A VEGETATED AREA. DENSE GRASS OR AREAS WITH NATURAL DEPRESSIONS WILL PROVIDE THE BEST CONDITIONS. CRITICAL AREAS LIKE WETLANDS (E.G. VERNAL POOLS) OR AREAS WITH SENSITIVE VEGETATION THAT WILL BE DAMAGED (SMOTHERING) BY SEDIMENTATION SHOULD NOT BE USED.

SEDIMENT TRAP OR BASIN – IN MOST CASES, CONTAMINATED DISCHARGE SHOULD BE DIRECTED TO A SEDIMENT TRAP WHERE THE SUSPENDED SOLIDS CAN SETTLE/FILTER OUT PRIOR TO THE DISCHARGE TO WATERS OF THE STATE. SEDIMENT TRAPS SHOULD HAVE SUFFICIENT STORAGE TO RECEIVE ALL THE DISCHARGED WATER FROM PUMPING AND DETAIN THIS WATER A MINIMUM OF 24 HOURS. THE SEDIMENT STORAGE VOLUME IS DIRECTLY RELATED TO THE PUMPING CAPACITY AND THE AMOUNT OF TURBIDITY. THE SEDIMENT POND SHOULD BE DESIGNED TO OPTIMIZE THE AMOUNT OF TRAVEL TIME THROUGH THE IMPOUNDMENT. THE SEDIMENT POND SHOULD NOT BE MORE THAN FOUR (4) FEET DEEP WITH THE DISTANCE BETWEEN THE INTAKE AND OUTLET MAXIMIZED TO THE EXTENT PRACTICAL.

PUMP INTAKES – PUMP INTAKES SHOULD WITHDRAW WATER FROM THE SURFACE OF THE TRENCH OR WORK AREA IN ORDER NOT TO RE-SUSPEND OR CONTINUALLY MIX WATER. CONTINUALLY DRAWING WATER FROM THE FLOOR OF THE AREA WILL DRAW THE MUDDIEST WATER AND INCREASE THE AMOUNT OF SEDIMENT THAT MUST BE REMOVED.

GEOTEXTILE FILTER BAGS – FILTER BAGS ARE AN INCREASINGLY COMMON WAY TO REMOVE SEDIMENT FROM DEWATERING DISCHARGE. DISCHARGE IS PUMPED INTO A FILTER BAG CHOSEN FOR THE PREDOMINANT SEDIMENT SIZE. FILTER BAGS ARE MANUFACTURED PRODUCTS MADE TYPICALLY FROM WOVEN MONOFILAMENT POLYPROPYLENE TEXTILE (COARSE MATERIALS, E.G. SANDS) OR NON-WOVEN GEOTEXTILE (SILTS/CLAYS). THEY ARE SINGLE USE PRODUCTS THAT MUST BE REPLACED WHEN THEY BECOME CLOGGED OR HALF FULL OF SEDIMENT.

WHILE THEY MAY BE USEFUL, THEY ARE GENERALLY HIGH FLOW PRODUCTS, WHICH HAVE LIMITED ABILITY TO TREAT FINE-GRAINED SEDIMENTS. GRAVITY DRAINED FILTER BAGS SHOULD APPLY THE FOLLOWING:
- THEY SHOULD PLACE OUTSIDE OF A VEGETATED FILTER AREA AND NOT IN CLOSE PROXIMITY TO THE STREAM OR WATER RESOURCE
- THEY MUST SIT ON A RELATIVELY FLAT GRADE SO THAT WATER LEAVING THE BAG DOES NOT CAUSE ADDITIONAL EROSION. PLACING THE BAG ON A FLAT BED OF AGGREGATE WILL MAXIMIZE THE FLOW AND USEFUL SURFACE AREA OF THE BAG
- THEY SHOULD BE USED IN CONJUNCTION WITH A LARGE VEGETATIVE BUFFER OR A SECONDARY POND OR BARRIER

ENHANCED TREATMENT THROUGH MULTIPLE PRACTICES – THE NEED FOR FURTHER REDUCTION IN TURBIDITY WILL LIKELY REQUIRE MORE THAN ONE TREATMENT MEASURE. THE FOLLOWING ARE DEVICES OR MEASURES THAT WHEN USED IN SEQUENCE WITH OTHERS WILL REDUCE TURBIDITY.

FILTER BAGS (GRAVITY FLOW) ARE HIGHLY VARIABLE DEPENDING ON THE PORE SIZE AND FLOW RATE. TYPICALLY FILTER BAGS ARE LIMITED TO REMOVING LARGE PARTICLES (SMALL SANDS AND LARGE SILTS).

SEDIMENT TRAPS, WEIR TANKS, FILTER BOXES ARE EFFECTIVE FOR THE REMOVAL OF LARGE PARTICLES SUCH AS SAND. THEIR EFFECTIVENESS INCREASES AS DETENTION TIMES INCREASE. SAND MEDIA FILTERS ARE EFFECTIVE FOR REMOVAL OF SMALLER PARTICLES SUCH AS SAND AND LARGE SILTS. THESE OFTEN HAVE THE ABILITY TO BACK-FLUSH AND THUS MAINTAIN EFFECTIVENESS AND FLOW RATE.

SOME COMMERCIALLY AVAILABLE ADDITIVES ARE AVAILABLE FOR FURTHER DECREASING TURBIDITY. CHITOSAN AND CHITIN BASED ADDITIVES HAVE BEEN SHOWN TO SIGNIFICANTLY INCREASE THE EFFECTIVENESS OF FILTRATION AND SETTLING. CHITOSAN (POLY-D-GLUCOSAMINE) IS A LOW-TOXICITY PRODUCT EXTRACTED FROM CHITIN (POLY-N-ACETYL-D-GLUCOSAMINE), A BY-PRODUCT OF THE SHELLFISH INDUSTRY. OTHER PRODUCTS SUCH AS ANIONIC POLYACRYLAMIDE (ANIONIC PAM) ARE COMMERCIALLY AVAILABLE TO INCREASE SETTLING. OFTEN THESE ARE UTILIZED THROUGH WET OR DRY DOSING MECHANISMS OR AS WATER RUNS OVER A GEL BLOCK UPSTREAM OF A SETTLING OR FILTRATION PRACTICE. EACH PRODUCT SHOULD BE UTILIZED WITHIN THE MANUFACTURERS SPECIFICATIONS AND TAILORED TO THE SOIL AND SITE CONDITIONS.

PARTICULATE FILTER UNITS UTILIZING CARTRIDGES OR ENCLOSED FILTER BAGS CAN REMOVE SMALLER PARTICLES DEPENDING ON THE FILTER SIZE. THIS TYPE OF MEASURE IS USUALLY NECESSARY TO TREAT CLAYS. FILTERS MAY NEED TO BE CHANGED DAILY OR MORE FREQUENTLY.

AN EXAMPLE OF AN ENHANCED TREATMENT MIGHT INCLUDE: DEWATERING A TRENCH WITH A TRASH PUMP TO A SETTLING TANK OR PIT THEN PUMPING FROM THE SETTLING PRACTICE TO A SAND MEDIA FILTER OR TO A PARTICULATE FILTER.

COMMON PROBLEMS/CONCERNS
1. COMPLETE SETTLING OF SOLIDS WITHIN THE SEDIMENT BASIN DOES NOT OCCUR PRIOR TO DISCHARGE. THE LENGTH TO WIDTH RATIO OF THE POND MUST BE INCREASED TO LENGTHEN TRAVEL TIME THROUGH THE STRUCTURE. IN ADDITION, A FLOCCULENT MAY BE NECESSARY TO PROMOTE SETTLEMENT.
2. WATER DISCHARGED FROM SUBSURFACE/GROUND WATER PUMPING MAYBE SIGNIFICANTLY LOWER IN TEMPERATURE THAN THAT OF THE RECEIVING STREAM. THE WATER WILL NEED PRE-CONDITIONED IN ORDER TO MINIMIZE THE BIOLOGICAL AFFECTS ON THE STREAM.

SPECIFICATIONS
1. A DE-WATERING PLAN SHALL BE DEVELOPED PRIOR TO THE COMMENCEMENT OF ANY PUMPING ACTIVITIES.
2. THE DE-WATERING PLAN SHALL INCLUDE ALL PUMPS AND RELATED EQUIPMENT NECESSARY FOR THE DEWATERING ACTIVITIES AND DESIGNATE AREAS FOR PLACEMENT OF PRACTICES. OUTLETS FOR PRACTICES SHALL BE PROTECTED FROM SCOUR EITHER BY RIPRAP PROTECTION, FABRIC LINER, OR OTHER ACCEPTABLE METHOD OF OUTLET PROTECTION.
3. WATER THAT IS NOT DISCHARGED INTO A SETTLING/TREATMENT BASIN BUT DIRECTLY INTO WATERS OF THE STATE SHALL BE MONITORED HOURLY. DISCHARGED WATER SHALL BE WITHIN 5 DEGREES (5°F) ± OF THE RECEIVING WATERS.
4. SETTLING BASINS SHALL NOT BE GREATER THAN FOUR (4) FEET IN DEPTH. THE BASIN SHALL BE CONSTRUCTED FOR SEDIMENT STORAGE AS OUTLINED IN THE RAINWATER & LAND DEVELOPMENT MANUAL, CHAPTER 6. THE INLET AND OUTLET FOR THE BASIN SHALL BE LOCATED AT THE FURTHEST POINTS OF THE STORAGE. A FLOATING OUTLET SHALL BE USED TO ENSURE THAT SETTLED SOLIDS DO NOT RE-SUSPEND DURING THE DISCHARGE PROCESS. THE SETTLING BASIN SHALL BE CLEANED OUT WHEN THE STORAGE HAS BEEN REDUCED BY 50% OF ITS ORIGINAL CAPACITY.
5. ALL NECESSARY NATIONAL, STATE AND LOCAL PERMITS SHALL BE SECURED PRIOR TO DISCHARGING INTO WATERS OF THE STATE.

HAZARDOUS MATERIAL HANDLING

1. CONSTRUCTION PERSONNEL, INCLUDING SUBCONTRACTORS WHO MAY USE OR HANDLE HAZARDOUS OR TOXIC MATERIALS, SHALL BE MADE AWARE OF THE FOLLOWING GENERAL GUIDELINES REGARDING DISPOSAL AND HANDLING OF HAZARDOUS AND CONSTRUCTION WASTES:
   a. PREVENT SPILLS
   b. USE PRODUCTS UP
   c. FOLLOW LABEL DIRECTIONS FOR DISPOSAL
   d. REMOVE LIDS FROM EMPTY BOTTLES AND CANS WHEN DISPOSING IN TRASH
   e. RECYCLE WASTES WHENEVER POSSIBLE
   f. DON'T POUR INTO WATERWAYS, STORM DRAINS OR ONTO THE GROUND
   g. DON'T POUR DOWN THE SINK, FLOOR DRAIN OR SEPTIC TANKS
   h. DON'T BURY CHEMICALS OR CONTAINERS
   i. DON'T BURN CHEMICALS OR CONTAINERS
   j. DON'T MIX CHEMICALS TOGETHER
2. CONTAINERS SHALL BE PROVIDED FOR THE PROPER COLLECTION OF ALL WASTE MATERIAL INCLUDING CONSTRUCTION DEBRIS, TRASH, PETROLEUM PRODUCTS AND ANY HAZARDOUS MATERIALS USED ON-SITE. CONTAINERS SHALL BE COVERED AND NOT LEAKING. ALL WASTE MATERIAL SHALL BE DISPOSED OF AT FACILITIES APPROVED FOR THAT MATERIAL. CONSTRUCTION DEMOLITION AND DEBRIS (CD&D) WASTE MUST BE DISPOSED OF AT AN OHIO EPA APPROVED CD&D LANDFILL.
3. NO CONSTRUCTION RELATED WASTE MATERIALS ARE TO BE BURIED ON-SITE. BY EXCEPTION, CLEAN FILL (BRICKS, HARDENED CONCRETE, SOIL) MAY BE UTILIZED IN A WAY WHICH DOES NOT ENCROACH UPON NATURAL WETLANDS, STREAMS OR FLOODPLAINS OR RESULT IN THE CONTAMINATION OF WATERS OF THE STATE.
4. HANDLING CONSTRUCTION CHEMICALS. MIXING, PUMPING, TRANSFERRING OR OTHER HANDLING OF CONSTRUCTION CHEMICALS SUCH AS FERTILIZER, LIME, ASPHALT, CONCRETE DRYING COMPOUNDS, AND ALL OTHER POTENTIALLY HAZARDOUS MATERIALS SHALL BE PERFORMED IN AN AREA AWAY FROM ANY WATERCOURSE, DITCH OR STORM DRAIN.
5. EQUIPMENT FUELING AND MAINTENANCE, OIL CHANGING, ETC., SHALL BE PERFORMED AWAY FROM WATERCOURSES, DITCHES OR STORM DRAINS, IN AN AREA DESIGNATED FOR THAT PURPOSE. THE DESIGNATED AREA SHALL BE EQUIPPED FOR RECYCLING OIL AND CATCHING SPILLS. SECONDARY CONTAINMENT SHALL BE PROVIDED FOR ALL FUEL OIL STORAGE TANKS. THESE AREAS MUST BE INSPECTED EVERY SEVEN DAYS AND WITHIN 24 HRS. OF A 0.5 INCH OR GREATER RAIN EVENT TO ENSURE THERE ARE NO EXPOSED MATERIALS WHICH WOULD CONTAMINATE STORM WATER. SITE OPERATORS MUST BE AWARE THAT SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC) REQUIREMENTS MAY APPLY. AN SPCC PLAN IS REQUIRED FOR SITES WITH ONE SINGLE ABOVE GROUND TANK OF 660 GALLONS OR MORE, ACCUMULATIVE ABOVE GROUND STORAGE OF 1330 GALLONS OR MORE, OR 42,000 GALLONS OF UNDERGROUND STORAGE. CONTAMINATED SOILS MUST BE DISPOSED OF IN ACCORDANCE WITH ITEM 8.
6. CONCRETE WASH WATER SHALL NOT BE ALLOWED TO FLOW TO STREAMS, DITCHES, STORM DRAINS, OR ANY OTHER WATER CONVEYANCE. A SUMP OR PIT WITH NO POTENTIAL FOR DISCHARGE SHALL BE CONSTRUCTED IF NEEDED TO CONTAIN CONCRETE WASH WATER. FIELD TILE OR OTHER SUBSURFACE DRAINAGE STRUCTURES WITHIN 10 FT. OF THE SUMP SHALL BE CUT AND PLUGGED. FOR SMALL PROJECTS, TRUCK CHUTES MAY BE RINSED AWAY FROM ANY WATER CONVEYANCES.
7. SPILL REPORTING REQUIREMENTS: SPILLS ON PAVEMENT SHALL BE ABSORBED WITH SAWDUST OR KITTY LITTER AND DISPOSED OF WITH THE TRASH AT A LICENSED SANITARY LANDFILL. HAZARDOUS OR INDUSTRIAL WASTES SUCH AS MOST SOLVENTS, GASOLINE, OIL-BASED PAINTS, AND CEMENT CURING COMPOUNDS REQUIRE SPECIAL HANDLING. SPILLS SHALL BE REPORTED TO OHIO EPA (1-800-282-9378). SPILLS OF 25 GALLONS OR MORE OF PETROLEUM PRODUCTS SHALL BE REPORTED TO OHIO EPA, THE LOCAL FIRE DEPARTMENT, AND THE LOCAL EMERGENCY PLANNING COMMITTEE WITHIN 30 MIN. OF THE DISCOVERY OF THE RELEASE. ALL SPILLS WHICH CONTACT WATERS OF THE STATE MUST BE REPORTED TO OHIO EPA.
8. CONTAMINATED SOILS. IF SUBSTANCES SUCH AS OIL, DIESEL FUEL, HYDRAULIC FLUID, ANTIFREEZE, ETC. ARE SPILLED, LEAKED, OR RELEASED ONTO THE SOIL, THE SOIL SHOULD BE DUG UP AND DISPOSED OF AT LICENSED SANITARY LANDFILL OR OTHER APPROVED PETROLEUM CONTAMINATED SOIL REMEDIATION FACILITY. (NOT A CONSTRUCTION/DEMOLITION DEBRIS LANDFILL). NOTE THAT STORM WATER RUN OFF ASSOCIATED WITH CONTAMINATED SOILS ARE NOT BE AUTHORIZED UNDER OHIO EPA'S GENERAL STORM WATER PERMIT ASSOCIATED WITH CONSTRUCTION ACTIVITIES.

INSPECTIONS

ALL STORMWATER MANAGEMENT BMPs ARE TO BE INSPECTED ON A REGULAR BASIS FOR FAILURE OR DEFECTS. FREQUENCY FOR THE INSPECTIONS ARE TO BE EVERY SEVEN DAYS OR WITHIN 24 HOURS OF A 0.5 INCH RAINFALL EVENT (EXCLUDING NON WORKING DAYS). INSPECTION FREQUENCY MAY BE REDUCED IN THE EVENT OF SITE CONSTRUCTION GOING DORMANT AND THE SITE IS TEMPORARILY STABILIZED OR SITE IS UNLIKELY TO RELEASE RUNOFF DUE TO WEATHER CONDITIONS FOR AN EXTENDED PERIOD OF TIME SUCH AS FROZEN GROUND.

QUALIFIED INSPECTION PERSONNEL SHALL PERFORM THE INSPECTIONS AND MAINTAIN RECORDS OF INSPECTION FOR A PERIOD OF 3 YEARS AFTER TERMINATION OF CONSTRUCTION. THE INSPECTION REPORT TO HAVE THE FOLLOWING DATA INCLUDED BUT NOT LIMITED TO:
- DATE
- NAMES, TITLES, AND QUALIFICATIONS OF INSPECTORS
- WEATHER FOR THE PERIOD SINCE THE LAST INSPECTION (E.G., BEGINNING, DURATION, & RAINFALL AMOUNT OF EACH STORM EVENT AND WHETHER A DISCHARGE OCCURRED);
- WEATHER AND A DESCRIPTION OF ANY DISCHARGES OCCURRING AT THE TIME OF THE INSPECTION;
- LOCATION(S) OF DISCHARGES OF SEDIMENT OR OTHER POLLUTANTS FROM THE SITE;
- LOCATION(S) OF BMPS THAT NEED TO BE MAINTAINED;
- LOCATION(S) OF BMPS THAT FAILED TO OPERATE AS DESIGNED OR PROVED INADEQUATE FOR A PARTICULAR LOCATION;
- LOCATION(S) WHERE ADDITIONAL BMPS ARE NEEDED THAT DID NOT EXIST AT THE TIME OF INSPECTION;
- CORRECTIVE ACTION REQUIRED INCLUDING ANY CHANGES TO THE SWP3 NECESSARY AND IMPLEMENTATION DATES

TABLE 1: PERMANENT STABILIZATION	
AREA REQUIRING PERMANENT STABILIZATION	TIME FRAME TO APPLY EROSION CONTROLS
ANY AREAS THAT WILL LIE DORMANT FOR ONE YEAR OR MORE	WITHIN SEVEN DAYS OF THE MOST RECENT DISTURBANCE
ANY AREAS WITHIN 50 FEET OF A SURFACE WATER OF THE STATE AND AT FINAL GRADE	WITHIN TWO DAYS OF REACHING FINAL GRADE
OTHER AREAS AT FINAL GRADE	WITHIN SEVEN DAYS OF REACHING FINAL GRADE WITHIN THAT AREA

TABLE 2: TEMPORARY STABILIZATION	
AREA REQUIRING PERMANENT STABILIZATION	TIME FRAME TO APPLY EROSION CONTROLS
ANY DISTURBED AREAS WITHIN 50 FEET OF A SURFACE WATER OF THE STATE AND NOT AT FINAL GRADE	WITHIN TWO DAYS OF THE MOST RECENT DISTURBANCE IF THE AREA WILL REMAIN IDLE FOR MORE THAN 14 DAYS
ANY DISTURBED AREAS THAT WILL BE DORMANT FOR MORE THAN 14 DAYS BUT LESS THAN ONE YEAR, AND NOT WITHIN 50 FEET OF A SURFACE WATER OF THE STATE	WITHIN SEVEN DAYS OF THE MOST RECENT DISTURBANCE WITHIN THE AREA. FOR RESIDENTIAL SUBDIVISIONS, DISTURBED AREAS MUST BE STABILIZED AT LEAST SEVEN DAYS PRIOR TO TRANSFER OF PERMIT COVERAGE FOR THE INDIVIDUAL LOT(S)
DISTURBED AREAS THAT WILL BE IDLE OVER WINTER	PRIOR TO THE ONSET OF WINTER WEATHER

REVISION | BY | DATE
CHANGE ORDER SCHEDULE | # | DESCRIPTION OF CHANGE

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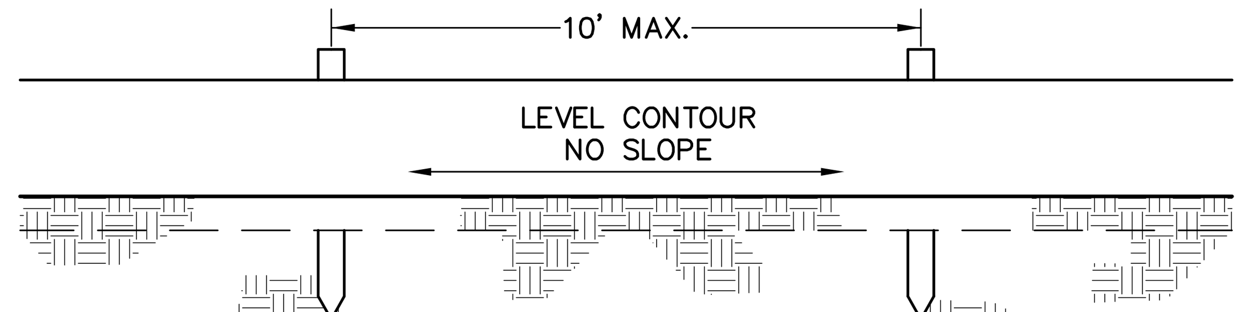
BERKSHIRE TOWNSHIP, DELAWARE COUNTY, OHIO
BERKSHIRE TOWNSHIP RECREATIONAL COURTS
1454 ROME CORNERS ROAD
STORMWATER POLLUTION PREVENTION NOTES

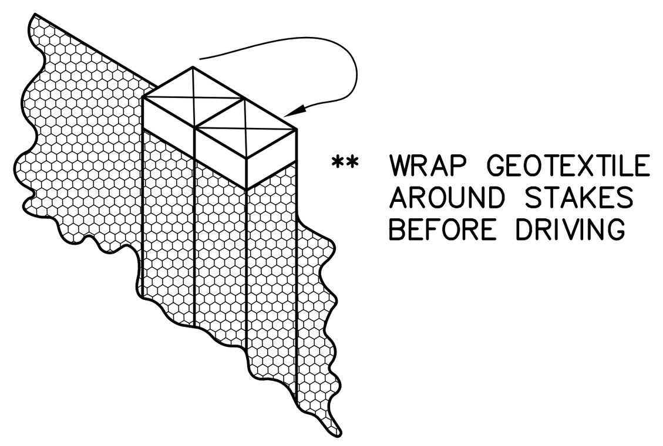
DRAWING SET STATUS:
- ☐ PRELIMINARY ENGINEERING SET
- ☐ AGENCY REVIEW SET
- ■ CONSTRUCTION DOCUMENT SET
- ☐ AS-BUILT DOCUMENT SET

DESIGN	DRAFT	CHECK
DGR	DGR	MSW

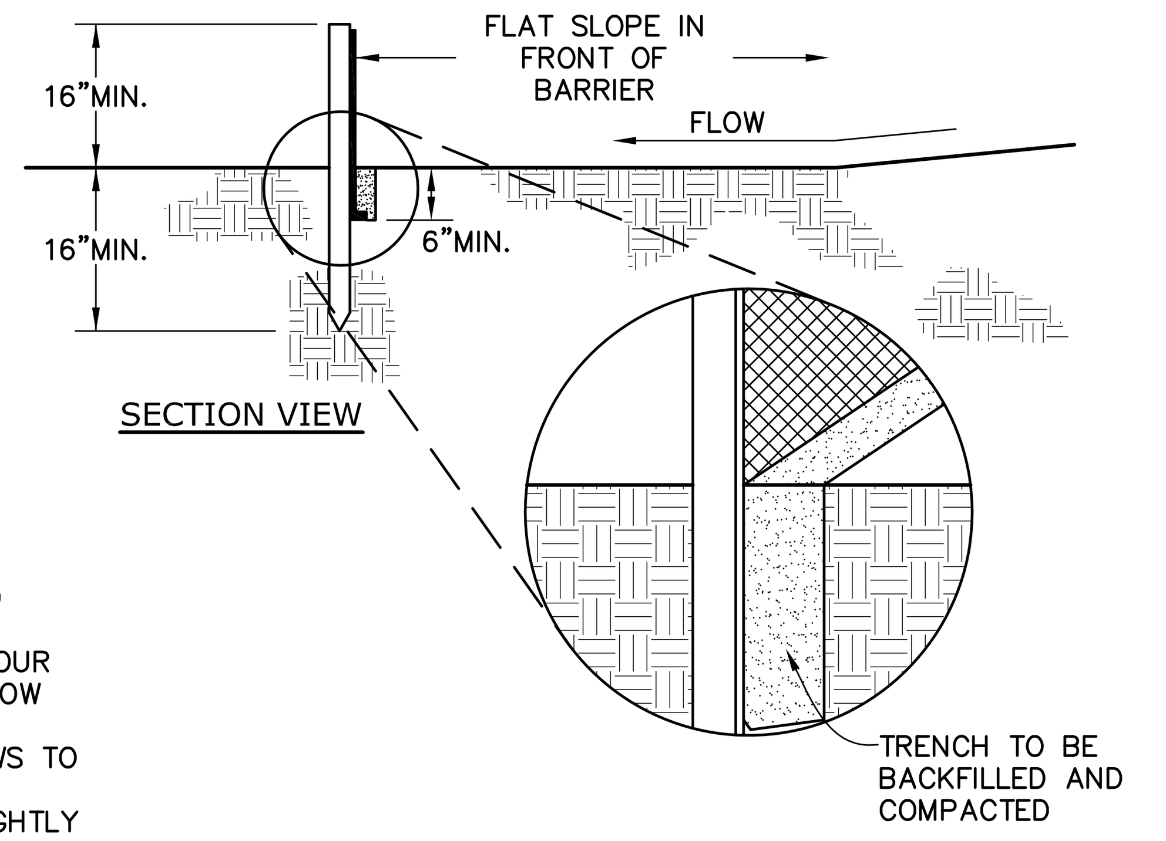
PROJECT NO.: 25-002
DATE: MARCH, 2025
SCALE: HORIZONTAL: N/A VERTICAL: N/A



ELEVATION VIEW



JOINING SECTIONS OF SILT FENCE



SECTION VIEW

SILT FENCE SPECIFICATIONS

1. SILT FENCE SHALL BE CONSTRUCTED BEFORE UPSLOPE LAND DISTURBANCE BEGINS.
2. ALL SILT FENCE SHALL BE PLACED AS CLOSE TO THE CONTOUR AS POSSIBLE SO THAT WATER WILL NOT CONCENTRATE AT LOW POINTS IN THE FENCE AND SO THAT SMALL SWALES OR DEPRESSIONS THAT MAY CARRY SMALL CONCENTRATED FLOWS TO THE SILT FENCE ARE DISSIPATED ALONG ITS LENGTH.
3. END OF THE SILT FENCES SHALL BE BROUGHT UPSLOPE SLIGHTLY SO THAT WATER PONDED BY THE SILT FENCE WILL BE PREVENTED FROM FLOWING AROUND THE ENDS.
4. SILT FENCE SHALL BE PLACED ON THE FLATTEST AREA AVAILABLE.
5. WHERE POSSIBLE, VEGETATION SHALL BE PRESERVED FOR 5 FEET (OR AS MUCH AS POSSIBLE) UPSLOPE FROM THE SILT FENCE. IF VEGETATION IS REMOVED, IT SHALL BE REESTABLISHED WITHIN 7 DAYS FROM THE INSTALLATION OF THE SILT FENCE.
6. THE HEIGHT OF THE SILT FENCE SHALL BE A MINIMUM OF 16 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
7. THE SILT FENCE SHALL BE PLACED IN AN EXCAVATED OR SLICED TRENCH CUT A MINIMUM OF 6 INCHES DEEP. THE TRENCH SHALL BE MADE WITH A TRENCHER, CABLE LAYING MACHINE, SLICING MACHINE, OR OTHER SUITABLE DEVICE THAT WILL ENSURE AN ADEQUATELY UNIFORM TRENCH DEPTH.
8. THE SILT FENCE SHALL BE PLACED WITH THE STAKES ON THE DOWNSLOPE SIDE OF THE GEOTEXTILE. A MINIMUM OF 8 INCHES OF GEOTEXTILE MUST BE BELOW THE GROUND SURFACE. EXCESS MATERIAL SHALL LAY ON THE BOTTOM OF THE 6-INCH DEEP TRENCH. THE TRENCH SHALL BE BACKFILLED AND COMPACTED ON BOTH SIDES OF THE FABRIC.
9. SEAMS BETWEEN SECTIONS OF SILT FENCE SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST WITH A MINIMUM OF 6-IN. OVERLAP PRIOR TO DRIVING INTO THE GROUND, (SEE DETAILS).
10. MAINTENANCE-SILT FENCE SHALL ALLOW RUNOFF TO PASS ONLY AS DIFFUSE FLOW THROUGH THE GEOTEXTILE. IF RUNOFF OVERTOPS THE SILT FENCE, FLOWS UNDER THE FABRIC OR AROUND THE FENCE ENDS, OR IN ANY OTHER WAY ALLOWS A CONCENTRATED FLOW DISCHARGE, ONE OF THE FOLLOWING SHALL BE PERFORMED, AS APPROPRIATE: 1) THE LAYOUT OF THE SILT FENCE SHALL BE CHANGED, 2) ACCUMULATED SEDIMENT SHALL BE REMOVED, OR 3) OTHER PRACTICES SHALL BE INSTALLED.

SEDIMENT DEPOSITS SHALL BE ROUTINELY REMOVED WHEN THE DEPOSITS REACHES APPROXIMATELY ONE-HALF OF THE HEIGHT OF THE SILT FENCE.

SILT FENCES SHALL BE INSPECTED AFTER EACH RAINFALL AND AT LEAST DAILY DURING A PROLONGED RAINFALL. THE LOCATION OF EXISTING SILT FENCE SHALL BE REVIEWED DAILY TO ENSURE ITS PROPER LOCATION AND EFFECTIVENESS. IF DAMAGED, THE SILT FENCE SHALL BE REPAIRED IMMEDIATELY.

CRITERIA FOR SILT FENCE MATERIALS

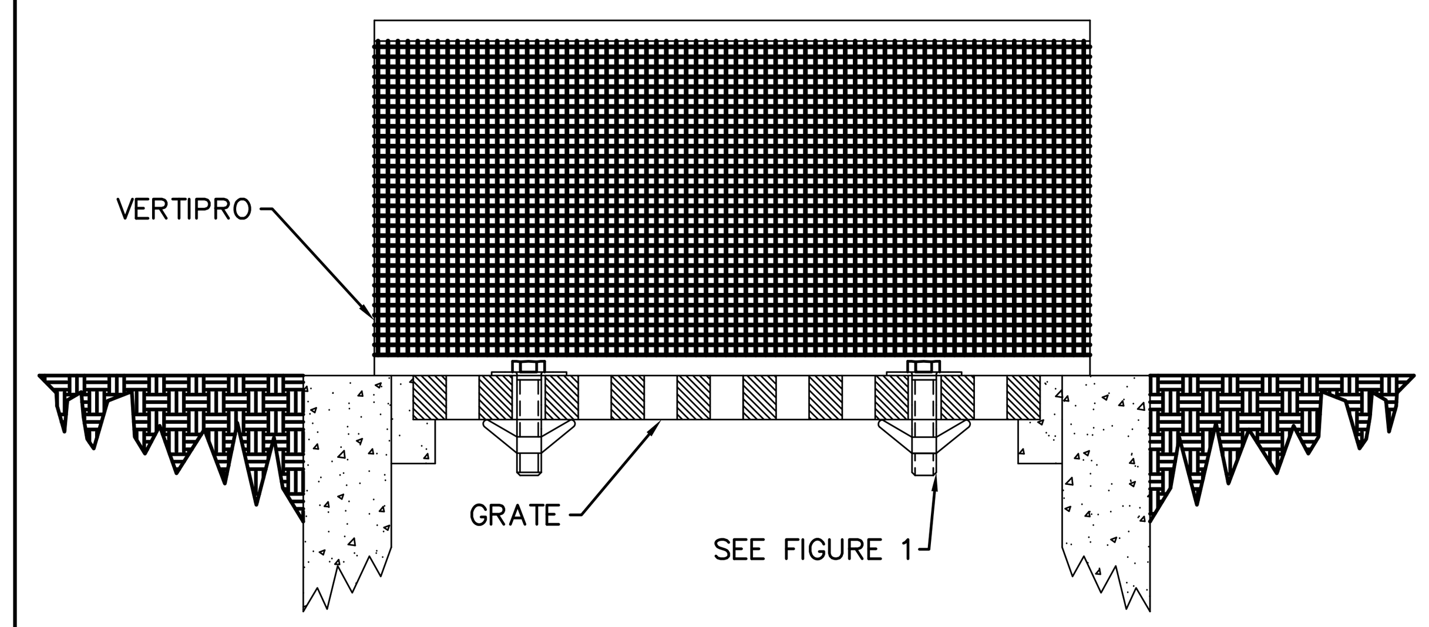
1. FENCE POST - THE LENGTH SHALL BE A MINIMUM OF 32 INCHES. WOOD POSTS WILL BE 2-BY-2-IN. NOMINAL DIMENSIONED HARDWOOD OF SOUND QUALITY. THEY SHALL BE FREE OF KNOTS, SPLITS AND OTHER VISIBLE IMPERFECTIONS, THAT WILL WEAKEN THE POSTS. THE MAXIMUM SPACING BETWEEN POSTS SHALL BE 10 FT. POSTS SHALL BE DRIVEN A MINIMUM OF 16 INCHES INTO THE GROUND, WHERE POSSIBLE. IF NOT POSSIBLE, THE POSTS SHALL BE ADEQUATELY SECURED TO PREVENT OVERTURNING OF THE FENCE DUE TO SEDIMENT/WATER LOADING.
2. SILT FENCE FABRIC-SEE CHART BELOW:

MIN. CRITERIA FOR SILT FENCE FABRIC (ODOT, 2002)

FABRIC PROPERTIES	VALUES	TEST METHOD
MINIMUM TENSILE STRENGTH	120 LBS	ASTM D 4632
MAXIMUM ELONGATION @ 60 LBS	50%	ASTM D 4632
MINIMUM PUNCTURE STRENGTH	50 LBS	ASTM D 4833
MINIMUM TEAR STRENGTH	40 LBS	ASTM D 4533
APPARENT OPENING SIZE	≤ 0.84 mm	ASTM D 4751
MINIMUM PERMITTIVITY	1x10-2 SEC.-1	ASTM D 4491
UV EXPOSURE STRENGTH RETENTION	70%	ASTM G 4355

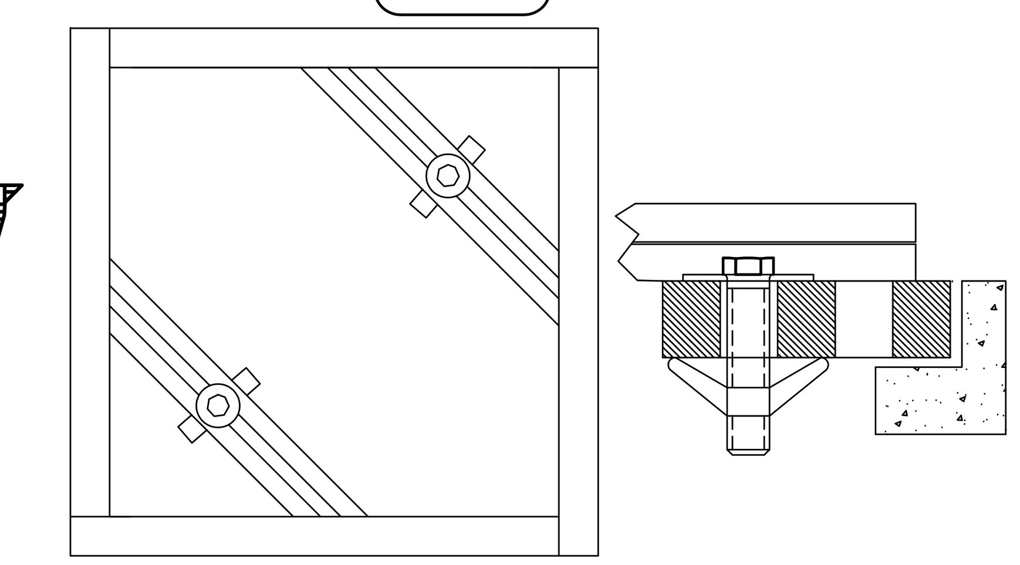
SILT FENCE BARRIER DETAIL

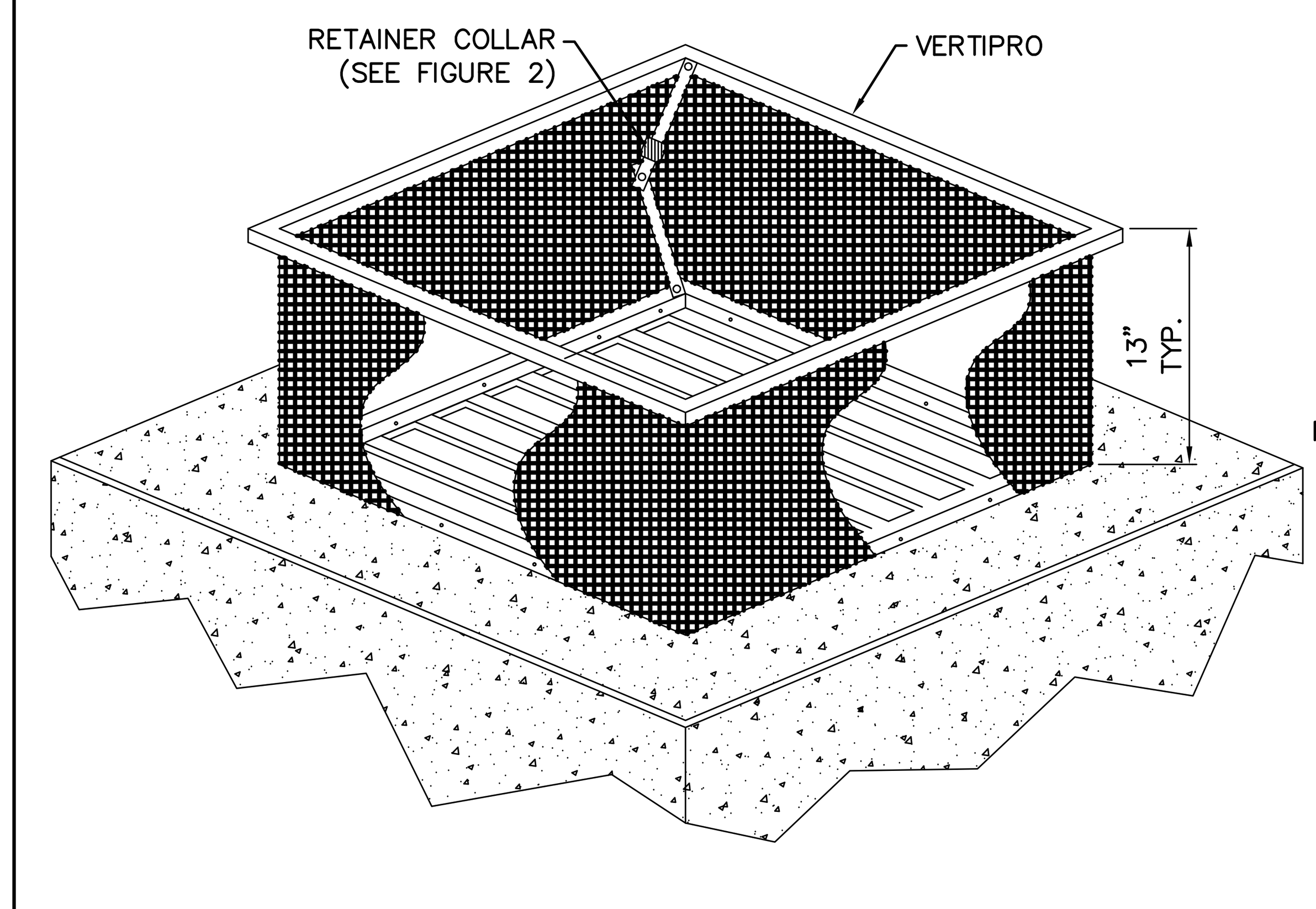
NOT TO SCALE



INSTALLATION: SURFACE OF GRATE MUST BE CLEAN AND FREE OF DIRT AND DEBRIS. POSITION VERTIPRO SQUARELY ON THE CATCH BASIN. INSTALL TOGGLE BOLT ASSEMBLY TO THE GRATE (SEE FIGURE 1) AND SECURE TIGHTLY BUT NOT TOO TIGHT. THE HOLD DOWN ASSEMBLY MUST EXTEND THROUGH THE FRAME AND THE GRATE LOCKING THE TWO TOGETHER. THE TOGGLE BOLT MUST ENGAGE TWO BARS ON GRATE. REPEAT ON OPPOSITE SIDE OF VERTIPRO.

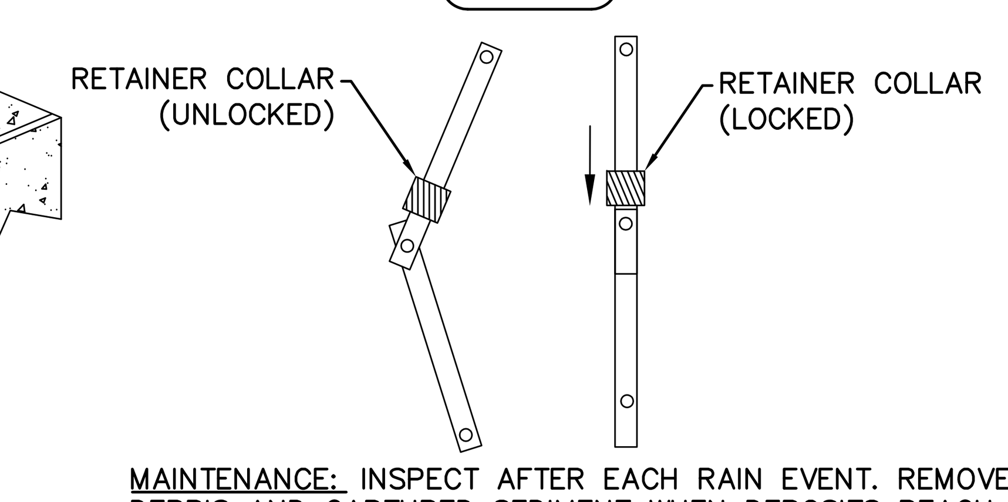
FIGURE 1





THE VERTIPRO HAS FOUR LEGS, ONE IN EACH CORNER THAT FOLDS IN THE MIDDLE ALLOWING THE VERTIPRO TO EASILY COLLAPSE FOR TRANSPORT AND STORAGE (SEE FIGURE 2). TO INSTALL, PULL TOP OF FRAME UP AND STRAIGHTEN THE LEGS. SLIDE RETAINER COLLAR DOWN SO THAT IT ENGAGES BOTH SECTIONS OF THE LEG. WHEN EXTENDED, RETAINER COLLAR WILL HOLD THE VERTIPRO IN AN UPRIGHT AND LOCKED POSITION. VERTIPRO STANDARD INSTALLED HEIGHT IS 13". CUSTOM SIZES ARE AVAILABLE.

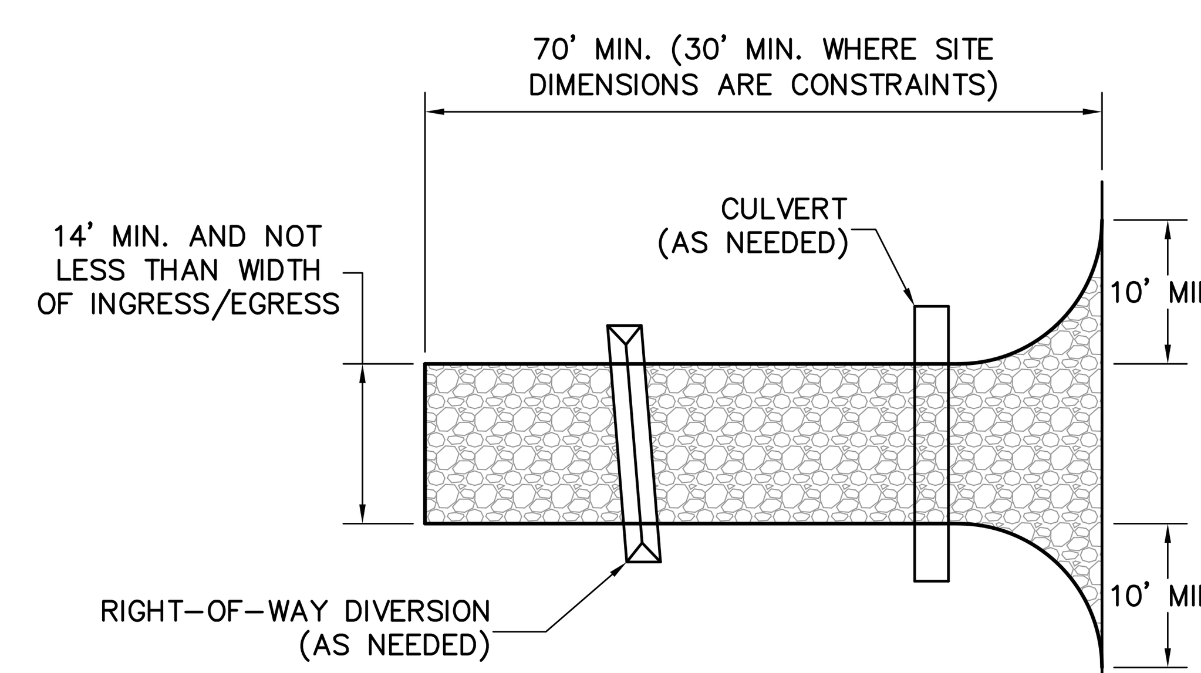
FIGURE 2



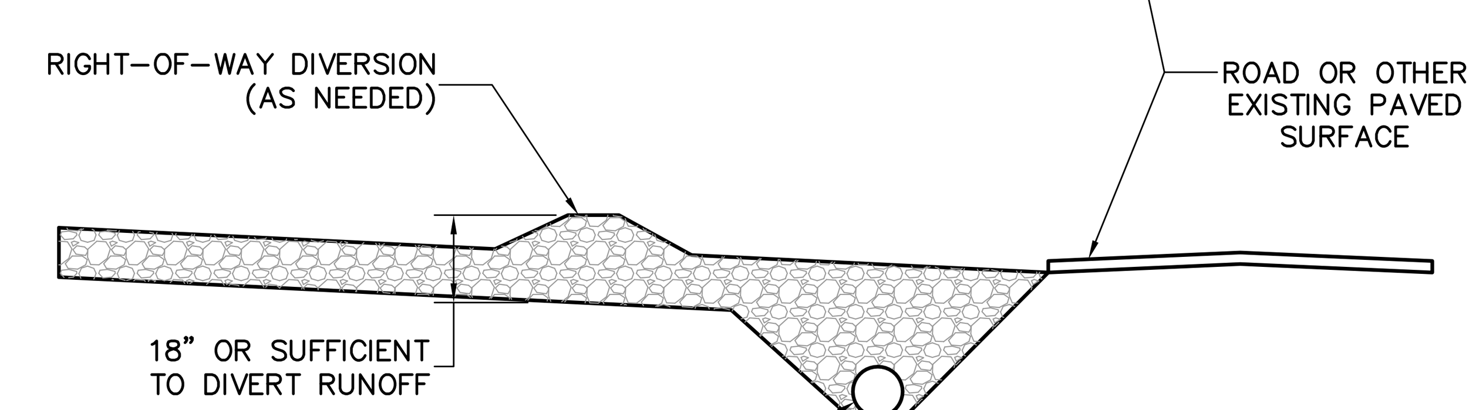
MAINTENANCE: INSPECT AFTER EACH RAIN EVENT. REMOVE DEBRIS AND CAPTURED SEDIMENT WHEN DEPOSITS REACH 7" OR 50% OF THE HEIGHT OF THE VERTIPRO. REMOVE CAPTURED DEBRIS FROM THE VERTIPRO FABRIC WITH A STIFF BRISTLE BRUSH.

VERTIPRO INLET PROTECTION APPLIANCE

NOT TO SCALE



PLAN VIEW



PROFILE VIEW

NOTE:
SEE THE STORMWATER POLLUTION PREVENTION PLAN FOR SPECIFIED LOCATION(S)

CONSTRUCTION ENTRANCE SPECIFICATIONS

1. STONE SIZE - ODOT # 2 (1.5-2.5 INCH) STONE SHALL BE USED, OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - THE CONSTRUCTION ENTRANCE SHALL BE AS LONG AS REQUIRED TO STABILIZE HIGH TRAFFIC AREAS BUT NOT LESS THAN 70 FT. (EXCEPTION: APPLY 30 FT. MINIMUM TO SINGLE RESIDENCE LOTS).
3. THICKNESS - THE STONE LAYER SHALL BE AT LEAST SIX (6) INCHES THICK FOR LIGHT DUTY ENTRANCES OR AT LEAST TEN (10) INCHES FOR HEAVY DUTY USE.
4. WIDTH - THE ENTRANCE SHALL BE AT LEAST FOURTEEN (14) FEET WIDE, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. GEOTEXTILE - A GEOTEXTILE SHALL BE LAID OVER THE ENTIRE AREA PRIOR TO PLACING STONE. IT SHALL BE COMPOSED OF STRONG ROT-PROOF POLYMERIC FIBERS AND MEET THE FOLLOWING SPECIFICATIONS:

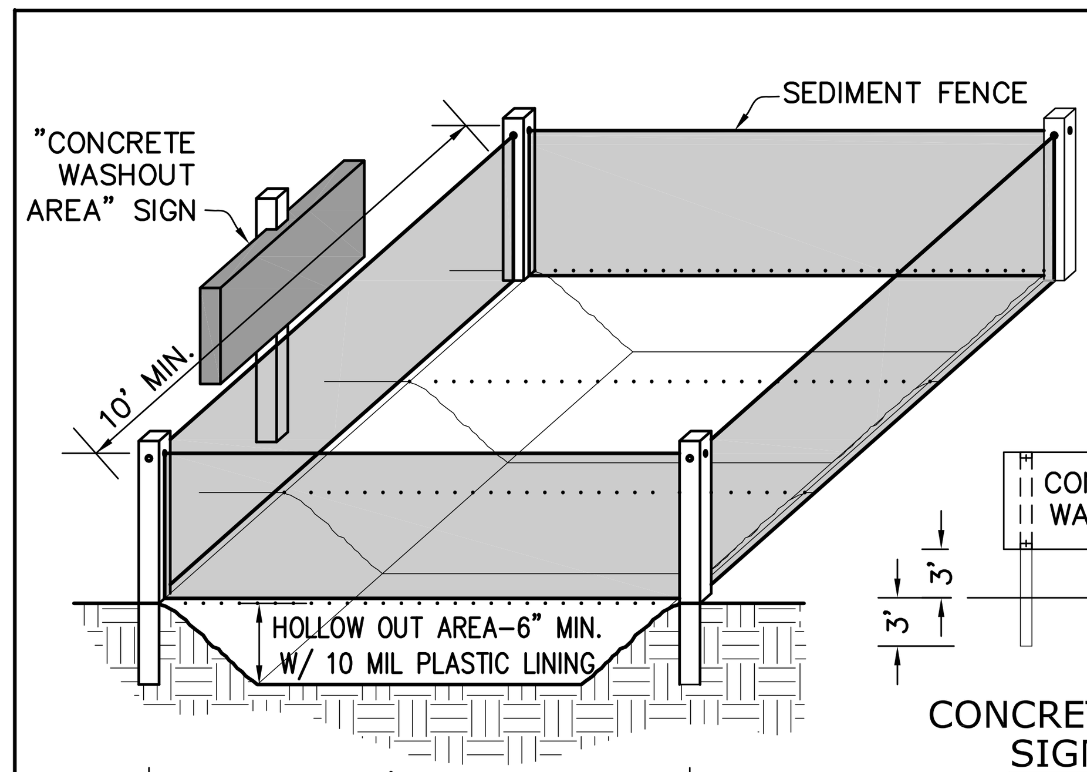
GEOTEXTILE SPECIFICATIONS FOR CONSTRUCTION ENTRANCE

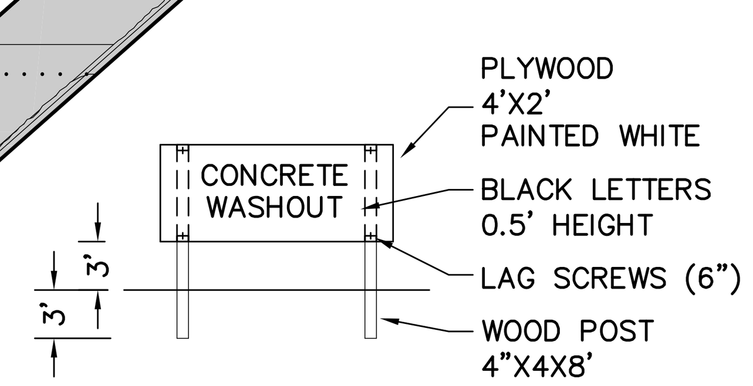
FABRIC PROPERTIES	VALUES
MINIMUM TENSILE STRENGTH	200 LBS
MINIMUM PUNCTURE STRENGTH	80 PSI
MINIMUM TEAR STRENGTH	50 LBS
MINIMUM BURST STRENGTH	320 PSI
MINIMUM ELONGATION	20%
EQUIVALENT OPENING SIZE	EOS < 0.6 mm
PERMITTIVITY	1x10-3 CM/SEC

6. TIMING - THE CONSTRUCTION ENTRANCE SHALL BE INSTALLED AS SOON AS IS PRACTICABLE BEFORE MAJOR GRADING ACTIVITIES.
7. CULVERT - A PIPE OR CULVERT SHALL BE CONSTRUCTED UNDER THE ENTRANCE IF NEEDED TO PREVENT SURFACE WATER FROM FLOWING ACROSS THE ENTRANCE OR TO PREVENT RUNOFF FROM BEING DIRECTED OUT ONTO PAVED SURFACES.
8. WATER BAR - A WATER BAR SHALL BE CONSTRUCTED AS PART OF THE CONSTRUCTION ENTRANCE IF NEEDED TO PREVENT SURFACE RUNOFF FROM FLOWING THE LENGTH OF THE CONSTRUCTION ENTRANCE AND OUT ONTO PAVED SURFACES.
9. MAINTENANCE - TOP DRESSING OF ADDITIONAL STONE SHALL BE APPLIED AS CONDITIONS DEMAND. MUD SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADS, OR ANY SURFACE WHERE RUNOFF IS NOT CHECKED BY SEDIMENT CONTROLS, SHALL BE REMOVED IMMEDIATELY. REMOVAL SHALL BE ACCOMPLISHED BY SCRAPING OR SWEEPING.
10. CONSTRUCTION ENTRANCES SHALL NOT BE RELIED UPON TO REMOVE MUD FROM VEHICLES AND PREVENT OFF-SITE TRACKING. VEHICLES THAT ENTER AND LEAVE THE CONSTRUCTION SITE SHALL BE RESTRICTED FROM MUDDY AREAS.
11. REMOVAL - THE ENTRANCE SHALL REMAIN IN PLACE UNTIL THE DISTURBED AREA IS STABILIZED OR REPLACED WITH A PERMANENT ROADWAY OR ENTRANCE.

CONSTRUCTION ENTRANCE

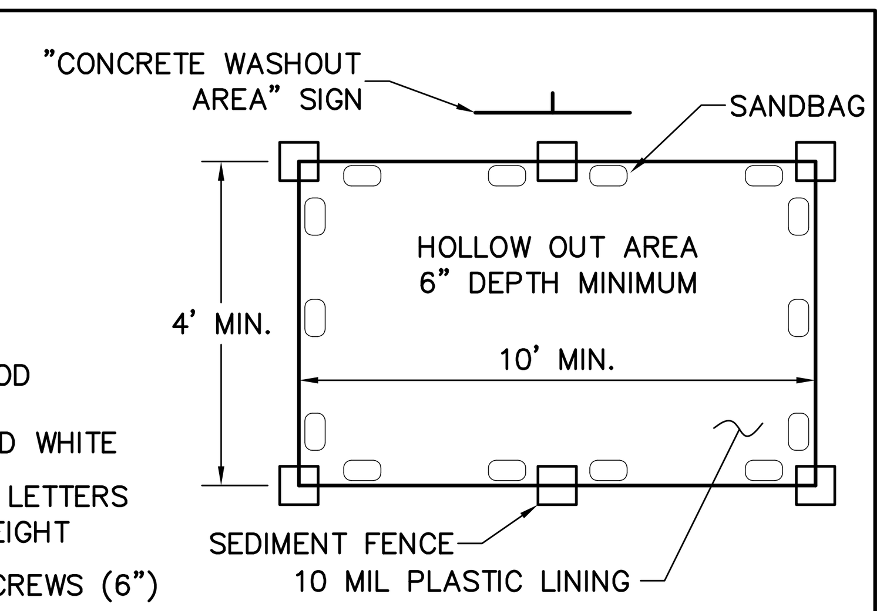
NOT TO SCALE



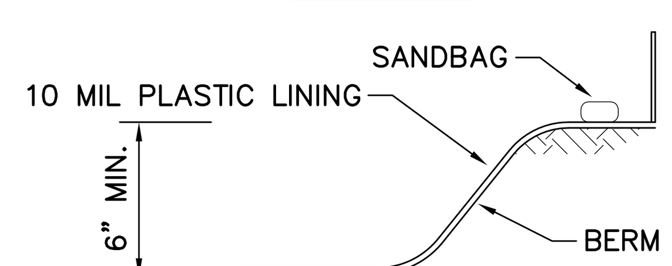


CONCRETE WASHOUT SIGN DETAIL

NOT TO SCALE



PLAN VIEW



SECTON A-A

NOT TO SCALE

NOTES:
1. ACTUAL LAYOUT DETERMINED IN THE FIELD
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30' OF THE TEMPORARY CONCRETE WASHOUT FACILITY
3. ACCUMULATED CONCRETE CALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.

CONCRETE WASHOUT AREA

NOT TO SCALE

REVISION

#	CHANGE ORDER SCHEDULE DESCRIPTION OF CHANGE	BY	DATE

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BERKSHIRE TOWNSHIP RECREATIONAL COURTS

1454 ROME CORNERS ROAD

STORMWATER POLLUTION PREVENTION DETAILS

DRAWING SET STATUS:
- ☐ PRELIMINARY ENGINEERING SET
- ☐ AGENCY REVIEW SET
- ■ CONSTRUCTION DOCUMENT SET
- ☐ AS-BUILT DOCUMENT SET

DESIGN	DRAFT	CHECK
DGR	DGR	MSW

PROJECT NO.: 25-002

DATE: MARCH, 2025

SCALE:
HORIZONTAL: N/A
VERTICAL: N/A

SHEET NO.: 10/10