

GENERAL NOTES

- COORDINATES, BEARINGS AND DISTANCES SHOWN HEREON ARE REFERRED TO THE MARYLAND COORDINATE SYSTEM (NAD'83/2011). ELEVATIONS SHOWN HEREON ARE REFERRED TO THE NAVD'88 DATUM.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ACTUAL SITE CONDITIONS PRIOR TO THE START OF ANY WORK. THERE IS NO WARRANTY OR GUARANTEE ON THE COMPLETENESS OR CORRECTNESS OF THE EXISTING CONDITION INFORMATION. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ARCHITECT/ENGINEER PRIOR TO THE START OF ANY WORK.
- THIS SURVEY WAS PROVIDED BY HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.
- SEE SHEET G-000 FOR GENERAL NOTES.
- SEE SHEET C-300 FOR GEOTECHNICAL NOTES.

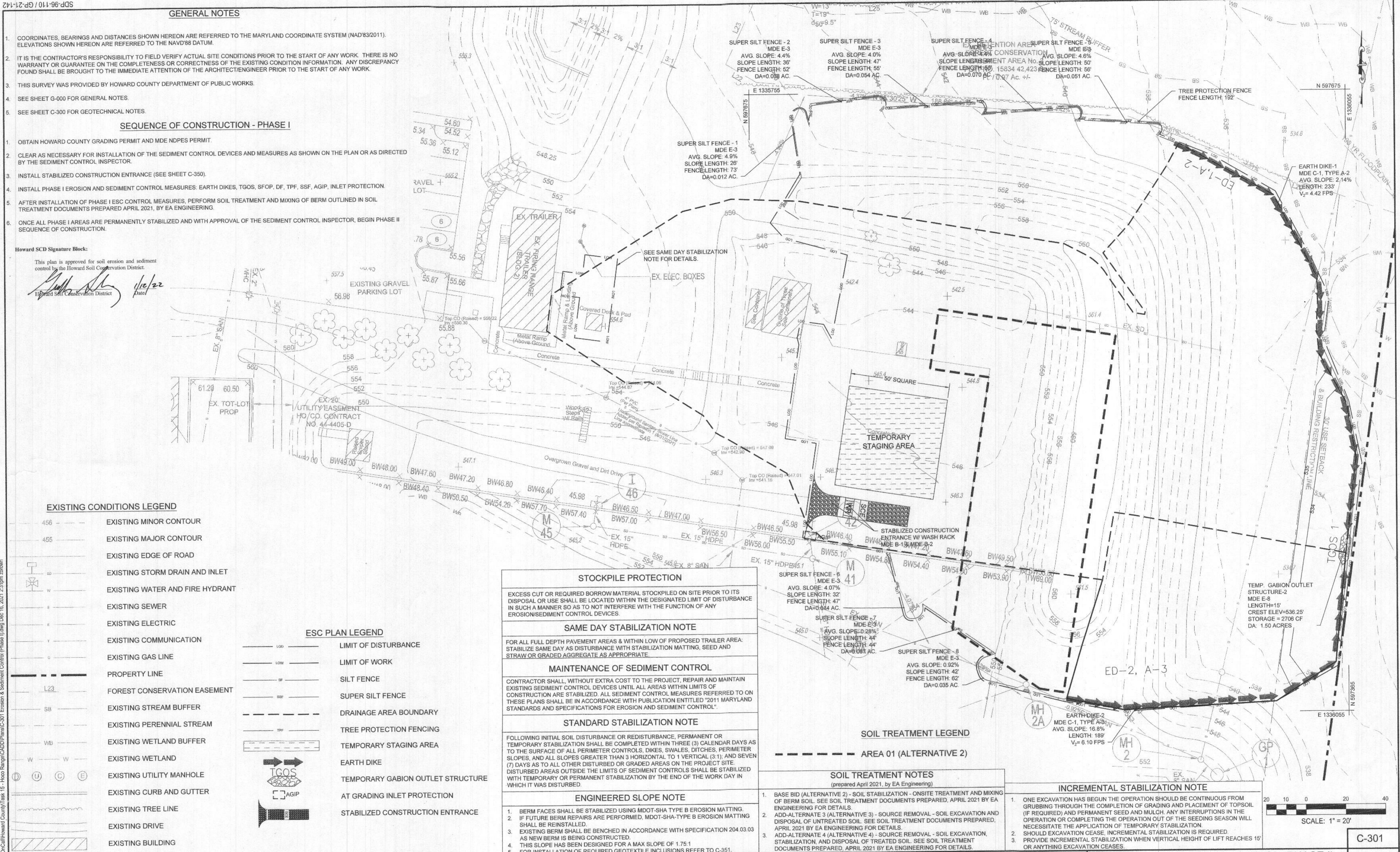
SEQUENCE OF CONSTRUCTION - PHASE I

- OBTAIN HOWARD COUNTY GRADING PERMIT AND MDE NDPS PERMIT.
- CLEAR AS NECESSARY FOR INSTALLATION OF THE SEDIMENT CONTROL DEVICES AND MEASURES AS SHOWN ON THE PLAN OR AS DIRECTED BY THE SEDIMENT CONTROL INSPECTOR.
- INSTALL STABILIZED CONSTRUCTION ENTRANCE (SEE SHEET C-350).
- INSTALL PHASE I EROSION AND SEDIMENT CONTROL MEASURES: EARTH DIKES, TGOS, SFOP, DF, TPF, SSF, AGIP, INLET PROTECTION.
- AFTER INSTALLATION OF PHASE I ESC CONTROL MEASURES, PERFORM SOIL TREATMENT AND MIXING OF BERM OUTLINED IN SOIL TREATMENT DOCUMENTS PREPARED APRIL 2021, BY EA ENGINEERING.
- ONCE ALL PHASE I AREAS ARE PERMANENTLY STABILIZED AND WITH APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, BEGIN PHASE II SEQUENCE OF CONSTRUCTION.

Howard SCD Signature Block:

This plan is approved for soil erosion and sediment control by the Howard Soil Conservation District.

Signature and date: 1/10/22



EXISTING CONDITIONS LEGEND

- 456 --- EXISTING MINOR CONTOUR
- 455 --- EXISTING MAJOR CONTOUR
- EXISTING EDGE OF ROAD
- EXISTING STORM DRAIN AND INLET
- EXISTING WATER AND FIRE HYDRANT
- EXISTING SEWER
- EXISTING ELECTRIC
- EXISTING COMMUNICATION
- EXISTING GAS LINE
- PROPERTY LINE
- L23 --- FOREST CONSERVATION EASEMENT
- SB --- EXISTING STREAM BUFFER
- EXISTING PERENNIAL STREAM
- WB --- EXISTING WETLAND BUFFER
- W --- EXISTING WETLAND
- U, C, E --- EXISTING UTILITY MANHOLE
- EXISTING CURB AND GUTTER
- EXISTING TREE LINE
- EXISTING DRIVE
- EXISTING BUILDING

ESC PLAN LEGEND

- LIMIT OF DISTURBANCE
- LIMIT OF WORK
- SILT FENCE
- SUPER SILT FENCE
- DRAINAGE AREA BOUNDARY
- TREE PROTECTION FENCING
- TEMPORARY STAGING AREA
- EARTH DIKE
- TEMPORARY GABION OUTLET STRUCTURE
- AT GRADING INLET PROTECTION
- STABILIZED CONSTRUCTION ENTRANCE

STOCKPILE PROTECTION
EXCESS CUT OR REQUIRED BORROW MATERIAL STOCKPILED ON SITE PRIOR TO ITS DISPOSAL OR USE SHALL BE LOCATED WITHIN THE DESIGNATED LIMIT OF DISTURBANCE IN SUCH A MANNER SO AS TO NOT INTERFERE WITH THE FUNCTION OF ANY EROSION/SEDIMENT CONTROL DEVICES.

SAME DAY STABILIZATION NOTE
FOR ALL FULL DEPTH PAVEMENT AREAS & WITHIN LOW OF PROPOSED TRAILER AREA. STABILIZE SAME DAY AS DISTURBANCE WITH STABILIZATION MATTING, SEED AND STRAW OR GRADED AGGREGATE AS APPROPRIATE.

MAINTENANCE OF SEDIMENT CONTROL
CONTRACTOR SHALL, WITHOUT EXTRA COST TO THE PROJECT, REPAIR AND MAINTAIN EXISTING SEDIMENT CONTROL DEVICES UNTIL ALL AREAS WITHIN LIMITS OF CONSTRUCTION ARE STABILIZED. ALL SEDIMENT CONTROL MEASURES REFERRED TO ON THESE PLANS SHALL BE IN ACCORDANCE WITH PUBLICATION ENTITLED "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL".

STANDARD STABILIZATION NOTE
FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND SEVEN (7) DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE. DISTURBED AREAS OUTSIDE THE LIMITS OF SEDIMENT CONTROLS SHALL BE STABILIZED WITH TEMPORARY OR PERMANENT STABILIZATION BY THE END OF THE WORK DAY IN WHICH IT WAS DISTURBED.

ENGINEERED SLOPE NOTE
1. BERM FACES SHALL BE STABILIZED USING MDO-T-SHA TYPE B EROSION MATTING.
2. IF FUTURE BERM REPAIRS ARE PERFORMED, MDO-T-SHA-TYPE B EROSION MATTING SHALL BE REINSTALLED.
3. EXISTING BERM SHALL BE BENCHED IN ACCORDANCE WITH SPECIFICATION 204.03.03 AS NEW BERM IS BEING CONSTRUCTED.
4. THIS SLOPE HAS BEEN DESIGNED FOR A MAX SLOPE OF 1.75:1
5. FOR INSTALLATION OF REQUIRED GEOTEXTILE INCLUSIONS REFER TO C-351.

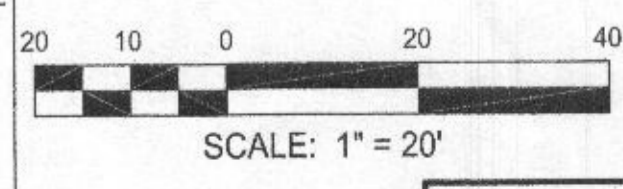
SOIL TREATMENT LEGEND
--- AREA 01 (ALTERNATIVE 2)

SOIL TREATMENT NOTES
(prepared April 2021, by EA Engineering)

- BASE BID (ALTERNATIVE 2) - SOIL STABILIZATION - ONSITE TREATMENT AND MIXING OF BERM SOIL. SEE SOIL TREATMENT DOCUMENTS PREPARED, APRIL 2021 BY EA ENGINEERING FOR DETAILS.
- ADD-ALTERNATE 3 (ALTERNATIVE 3) - SOURCE REMOVAL - SOIL EXCAVATION AND DISPOSAL OF UNTREATED SOIL. SEE SOIL TREATMENT DOCUMENTS PREPARED, APRIL 2021 BY EA ENGINEERING FOR DETAILS.
- ADD-ALTERNATE 4 (ALTERNATIVE 4) - SOURCE REMOVAL - SOIL EXCAVATION, STABILIZATION AND DISPOSAL OF TREATED SOIL. SEE SOIL TREATMENT DOCUMENTS PREPARED, APRIL 2021 BY EA ENGINEERING FOR DETAILS.

INCREMENTAL STABILIZATION NOTE

- ONE EXCAVATION HAS BEGUN THE OPERATION SHOULD BE CONTINUOUS FROM GRUBBING THROUGH THE COMPLETION OF GRADING AND PLACEMENT OF TOPSOIL (IF REQUIRED) AND PERMANENT SEED AND MULCH. ANY INTERRUPTIONS IN THE OPERATION OR COMPLETING THE OPERATION OUT OF THE SEEDING SEASON WILL NECESSITATE THE APPLICATION OF TEMPORARY STABILIZATION.
- SHOULD EXCAVATION CEASE, INCREMENTAL STABILIZATION IS REQUIRED.
- PROVIDE INCREMENTAL STABILIZATION WHEN VERTICAL HEIGHT OF LIFT REACHES 15' OR ANYTHING EXCAVATION CEASES.



APPROVED: DEPARTMENT OF PLANNING AND ZONING
Date: 1/15/22
Date: 2/3/22
Date: 2/3/22

RK&K
RICHARD KLEPPER & PAUL LLP
700 East Pratt Street, Suite 500
Baltimore, MD 21202
PH: 410.728.2900
www.rkk.com

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. MATTHEW THOMASSON
LICENSE NO. 41799
EXPIRATION DATE: APRIL 12, 2022.

DESIGN BY: CWWW / ZWB
DRAWN BY: ZWB
CHECKED BY: MBT
DATE: 12/17/2021

BY	NO.	REVISION	DATE
RK&K	1	FIRING RANGE BERM RE-GRADING	

OWNER/DEVELOPER
HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS
3430 COURT HOUSE DRIVE
ELLICOTT CITY, MD 21043-4300

EROSION & SEDIMENT CONTROL (PHASE I)
HOWARD COUNTY - DEPARTMENT OF PUBLIC WORKS
PUBLIC SAFETY TRAINING CENTER
RANGE IMPROVEMENTS
SHEET 77 OF 81

RK&K PROJECT NUMBER 17240.015
SCALE: 1" = 20'

RECEIVED
NOV 08 2022
LICENSES & PERMITS
DIVISION

GENERAL NOTES

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 - THIS SURVEY WAS PROVIDED BY HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.
 - SEE SHEET G-000 FOR GENERAL NOTES.
 - SEE SHEET C-300 FOR GEOTECHNICAL NOTES.
- SEQUENCE OF CONSTRUCTION - PHASE II**
- COMPLETE SEQUENCE OF CONSTRUCTION - PHASE I (SHEET C-301).
 - LEAVE IN PLACE THE REMAINING PHASE I EROSION AND SEDIMENT CONTROL DEVICES SUCH AS CONSTRUCTION ENTRANCES, STABILIZED CONSTRUCTION PATH, SUPER SILT AND DIVERSION FENCES, MOUNTABLE BERM, RIPRAP INFLOW PROTECTION, AND AT GRADE INLET PROTECTIONS.
 - MAINTAIN ACCESS TO THE STABILIZED CONSTRUCTION ENTRANCE AT ALL TIMES DURING THIS PHASE.
 - CONSTRUCT PROPOSED UNPAVED ACCESS ROAD AND FREE STANDING BALLISTIC WALL, STORMWATER UTILITIES AND ALL ASSOCIATED SITE GRADING. PROVIDE INCREMENTAL STABILIZATION PER B-4-1 WHEN THE VERTICAL HEIGHT OF LIFT REACHES 15' OR ANYTIME GRADING OPERATIONS CEASE. COMPLY WITH B-4-1 DURING ALL GRADING OPERATIONS.
 - ONCE ALL PHASE II AREAS ARE PERMANENTLY STABILIZED AND WITH APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, REMOVE ALL CONSTRUCTION ENTRANCES AND THE STABILIZED CONSTRUCTION PATH, AND STABILIZE THOSE AREAS. PROVIDE PERMANENT STABILIZATION TO THOSE AREAS DISTURBED BY THIS OPERATION. LEAVE IN PLACE ALL OTHER PHASE II EROSION AND SEDIMENT CONTROL DEVICES.

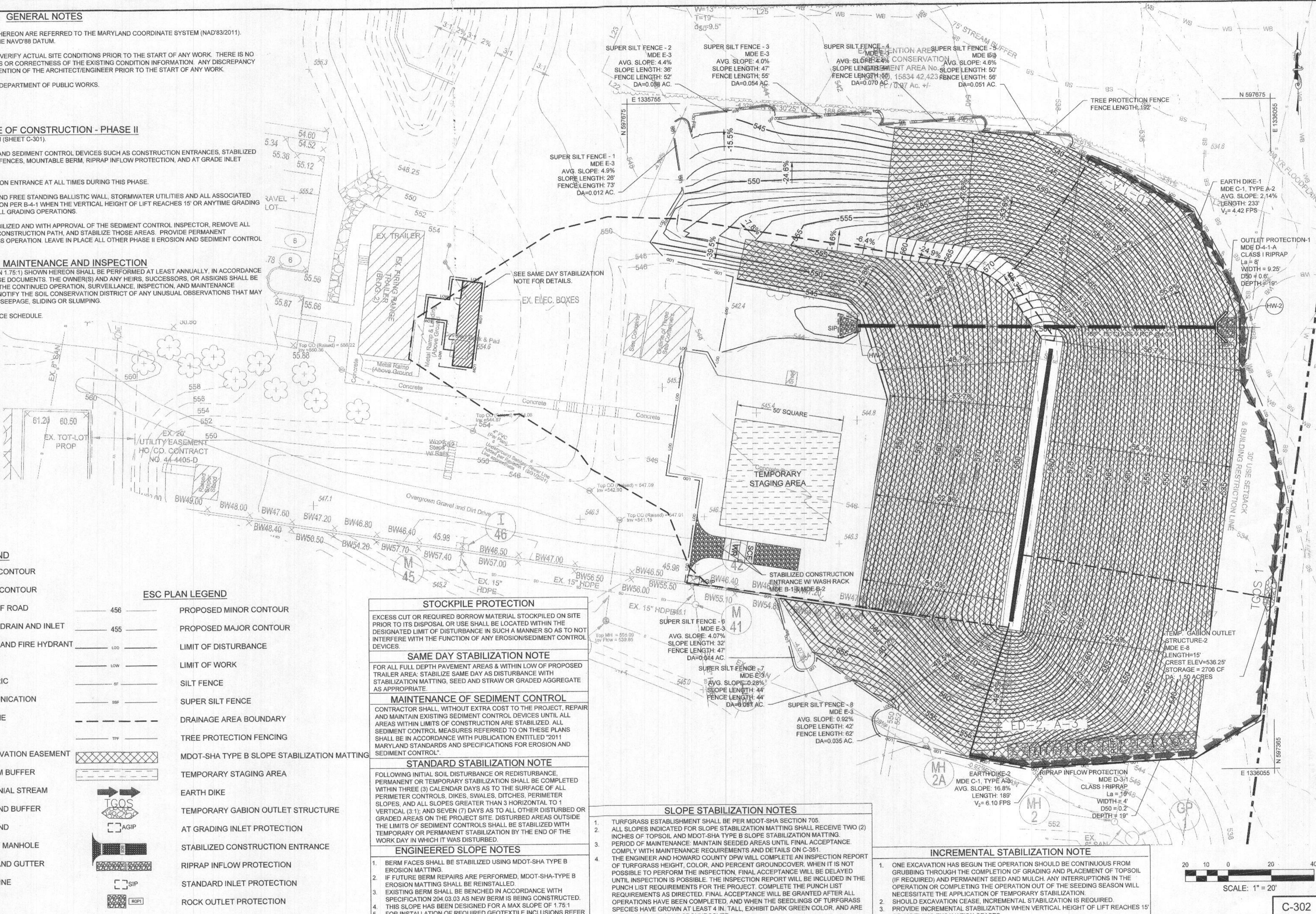
OPERATION, MAINTENANCE AND INSPECTION

- INSPECTION OF THE STEEP SLOPES (GREATER THAN 1.75:1) SHOWN HEREON SHALL BE PERFORMED AT LEAST ANNUALLY, IN ACCORDANCE WITH THE REQUIREMENTS CONTAINED WITHIN THESE DOCUMENTS. THE OWNER(S) AND ANY HEIRS, SUCCESSORS, OR ASSIGNS SHALL BE RESPONSIBLE FOR THE SAFETY OF THE BERM AND THE CONTINUED OPERATION, SURVEILLANCE, INSPECTION, AND MAINTENANCE THEREOF. THE BERM OWNER(S) SHALL PROMPTLY NOTIFY THE SOIL CONSERVATION DISTRICT OF ANY UNUSUAL OBSERVATIONS THAT MAY BE INDICATIONS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, SLIDING OR SLUMPING.
- SEE SHEET C-300 FOR OPERATION AND MAINTENANCE SCHEDULE.

Howard SCD Signature Block:

This plan is approved for soil erosion and sediment control by the Howard Soil Conservation District.

[Signature] 1/10/22
Howard Soil Conservation District



EXISTING CONDITIONS LEGEND

456	EXISTING MINOR CONTOUR
455	EXISTING MAJOR CONTOUR
---	EXISTING EDGE OF ROAD
---	EXISTING STORM DRAIN AND INLET
---	EXISTING WATER AND FIRE HYDRANT
---	EXISTING SEWER
---	EXISTING ELECTRIC
---	EXISTING COMMUNICATION
---	EXISTING GAS LINE
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---	EXISTING UTILITY MANHOLE
---	EXISTING CURB AND GUTTER
---	EXISTING TREE LINE
---	EXISTING DRIVE
---	EXISTING BUILDING

ESC PLAN LEGEND

---	PROPOSED MINOR CONTOUR
---	PROPOSED MAJOR CONTOUR
---	LIMIT OF DISTURBANCE
---	LIMIT OF WORK
---	SILT FENCE
---	SUPER SILT FENCE
---	DRAINAGE AREA BOUNDARY
---	TREE PROTECTION FENCING
---	MDOT-SHA TYPE B SLOPE STABILIZATION MATTING
---	TEMPORARY STAGING AREA
---	EARTH DIKE
---	TEMPORARY GABION OUTLET STRUCTURE
---	AT GRADING INLET PROTECTION
---	STABILIZED CONSTRUCTION ENTRANCE
---	RIPRAP INFLOW PROTECTION
---	STANDARD INLET PROTECTION
---	ROCK OUTLET PROTECTION

STOCKPILE PROTECTION

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SAME DAY STABILIZATION NOTE

FOR ALL FULL DEPTH PAVEMENT AREAS & WITHIN LOW OF PROPOSED TRAILER AREA, STABILIZE SAME DAY AS DISTURBANCE WITH STABILIZATION MATTING, SEED AND STRAW OR GRADED AGGREGATE AS APPROPRIATE.

MAINTENANCE OF SEDIMENT CONTROL

CONTRACTOR SHALL, WITHOUT EXTRA COST TO THE PROJECT, REPAIR AND MAINTAIN EXISTING SEDIMENT CONTROL DEVICES UNTIL ALL AREAS WITHIN LIMITS OF CONSTRUCTION ARE STABILIZED. ALL SEDIMENT CONTROL MEASURES REFERRED TO ON THESE PLANS SHALL BE IN ACCORDANCE WITH PUBLICATION ENTITLED "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL".

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ENGINEERED SLOPE NOTES

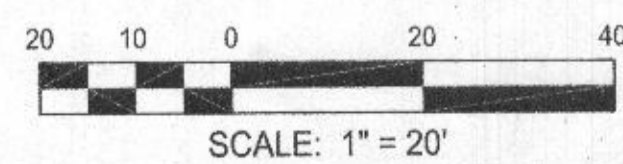
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- IF FUTURE BERM REPAIRS ARE PERFORMED, MDOT-SHA-TYPE B EROSION MATTING SHALL BE REINSTALLED.
- EXISTING BERM SHALL BE BENCHMARKED IN ACCORDANCE WITH SPECIFICATION 204.03.03 AS NEW BERM IS BEING CONSTRUCTED.
- THIS SLOPE HAS BEEN DESIGNED FOR A MAX SLOPE OF 1.75:1.
- FOR INSTALLATION OF REQUIRED GEOTEXTILE INCLUSIONS REFER TO C-351.

SLOPE STABILIZATION NOTES

- TURFGRASS ESTABLISHMENT SHALL BE PER MDOT-SHA SECTION 705.
- ALL SLOPES INDICATED FOR SLOPE STABILIZATION MATTING SHALL RECEIVE TWO (2) INCHES OF TOPSOIL AND MDOT-SHA TYPE B SLOPE STABILIZATION MATTING.
- PERIOD OF MAINTENANCE: MAINTAIN SEEDING AREAS UNTIL FINAL ACCEPTANCE. COMPLY WITH MAINTENANCE REQUIREMENTS AND DETAILS ON C-351.
- THE ENGINEER AND HOWARD COUNTY DPW WILL COMPLETE AN INSPECTION REPORT OF TURFGRASS HEIGHT, COLOR, AND PERCENT GROUND COVER. WHEN IT IS NOT POSSIBLE TO PERFORM THE INSPECTION, FINAL ACCEPTANCE WILL BE DELAYED UNTIL INSPECTION IS POSSIBLE. THE INSPECTION REPORT WILL BE INCLUDED IN THE PUNCH LIST REQUIREMENTS FOR THE PROJECT. COMPLETE THE PUNCH LIST REQUIREMENTS AS DIRECTED. FINAL ACCEPTANCE WILL BE GRANTED AFTER ALL OPERATIONS HAVE BEEN COMPLETED, AND WHEN THE SEEDLINGS OF TURFGRASS SPECIES HAVE GROWN AT LEAST 4 IN. TALL, EXHIBIT DARK GREEN COLOR, AND ARE AT LEAST 95 PERCENT GROUND COVER.

INCREMENTAL STABILIZATION NOTE

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- SHOULD EXCAVATION CEASE, INCREMENTAL STABILIZATION IS REQUIRED.
- PROVIDE INCREMENTAL STABILIZATION WHEN VERTICAL HEIGHT OF LIFT REACHES 15' OR ANYTIME EXCAVATION CEASES.



APPROVED: DEPARTMENT OF PLANNING AND ZONING

1/10/22
Date

2/3/22
Date

2/3/22
Date

RK&K
RUSSELL, KLEPPER & KAHL, LLP
ENGINEERING, ARCHITECTURE, INTERIOR DESIGN, ENVIRONMENTAL SCIENCE
RESPONSIVE PEOPLE • CREATIVE SOLUTIONS
700 East Pratt Street, Suite 500
Baltimore, MD 21202
Contact: John P. Spagnier
Ph: 410.728.2500
www.rkk.com

PROFESSIONAL CERTIFICATION

PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. MATTHEW THOMASISON
LICENSE NO. 41799
EXPIRATION DATE: APRIL 12, 2022.

DESIGN BY: CWMW / ZWB
DRAWN BY: ZWB
CHECKED BY: MBT
DATE: 12/17/2021

BY	NO.	REVISION	DATE

OWNER/DEVELOPER
HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS
3430 COURT HOUSE DRIVE
ELLCOTT CITY, MD 21043-4300

EROSION & SEDIMENT CONTROL (PHASE II)
HOWARD COUNTY - DEPARTMENT OF PUBLIC WORKS
PUBLIC SAFETY TRAINING CENTER
RANGE IMPROVEMENTS
2200 SCOTT WHEELER DRIVE, MARRIOTTSVILLE, MD 21104
TAX MAP: 0016 PARCEL: 0253 GRD: 0008 ZONED: EXEMPT
ELECTION DISTRICT 3 - HOWARD COUNTY, MARYLAND
SHEET 78 OF 81

RECEIVED
NOV 08 2022
DIVISION

SCALE: 1" = 20'

C-302
RK&K PROJECT NUMBER 17240.015

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

CONSTRUCTION SPECIFICATIONS

- PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
- PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE. MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
- PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
- PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
- MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

DETAIL B-4-6-D PERMANENT SOIL STABILIZATION MATTING SLOPE APPLICATION

CONSTRUCTION SPECIFICATIONS

- USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
- USE PERMANENT SOIL STABILIZATION MATTING MADE OF OPEN WEAVE SYNTHETIC, NON-DEGRADABLE FIBERS OR ELEMENTS OF UNIFORM THICKNESS AND DISTRIBUTION THROUGHOUT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
- SECURE MATTING USING STEEL STAPLES OR WOOD STAKES. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1 1/2 INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPE AT THE BOTTOM.
- PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS. UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
- UNROLL MATTING DOWN SLOPE. LAY MATTING SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
- OVERLAP OR ABUT EDGES OF MATTING ROLLS PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL EDGES BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.
- KEY IN THE TOP OF SLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
- STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
- IF SPECIFIED BY THE DESIGNER OR MANUFACTURER AND DEPENDING ON THE TYPE OF MAT BEING INSTALLED, ONCE THE MATTING IS KEYS AND STAPLED IN PLACE, FILL THE MAT VOIDS WITH TOP SOIL OR GRANULAR MATERIAL AND LIGHTLY COMPACT OR ROLL TO MAXIMIZE SOIL/MAT CONTACT WITHOUT CRUSHING MAT.
- ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

DETAIL B-2 WASH RACK OPTION

CONSTRUCTION SPECIFICATIONS

- USE A WASH RACK DESIGNED AND CONSTRUCTED/MANUFACTURED FOR THE ANTICIPATED TRAFFIC LOADS. CONCRETE, STEEL, OR OTHER MATERIALS ARE ACCEPTABLE. PRE-FABRICATED UNITS SUCH AS CATTLE GUARDS ARE ACCEPTABLE. USE MINIMUM DIMENSION OF 6 FEET X 10 FEET. ORIENT DIRECTION OF RIBS AS SHOWN ON THE DETAIL.
- INSTALL PRIOR TO, ALONG SIDE OF, OR AS PART OF THE SCE.
- DIRECT WASH WATER TO AN APPROVED SEDIMENT TRAPPING DEVICE.
- KEEP AREA UNDER WASH RACK FREE OF ACCUMULATED SEDIMENT. IF DAMAGED, REPAIR OR REPLACE WASH RACK.

DETAIL D-4-1-A ROCK OUTLET PROTECTION I

RIPRAP	
CLASS	THICKNESS (T)
I	19 IN
II	32 IN
III	46 IN

CONSTRUCTION SPECIFICATIONS

- RIPRAP AND STONE MUST CONFORM TO THE SPECIFIED CLASS.
- NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, AND PROTECT FROM PUNCTURING, CUTTING, OR TEARING. REPAIR ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. PROVIDE A MINIMUM OF ONE FOOT OVERLAP FOR ALL REPAIRS AND FOR JOINING TWO PIECES OF GEOTEXTILE TOGETHER.
- PREPARE THE SUBGRADE FOR GEOTEXTILE OR STONE FILTER (3/4 TO 1 1/2 INCH STONE FOR 6 INCH MINIMUM DEPTH) AND RIPRAP TO THE REQUIRED LINES AND GRADES. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
- EXTEND GEOTEXTILE AT LEAST 6 INCHES BEYOND EDGES OF RIPRAP AND EMBED AT LEAST 4 INCHES AT SIDES OF THE RIPRAP.
- CONSTRUCT RIPRAP OUTLET TO FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. PLACE STONE FOR RIPRAP OUTLET IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. PLACE RIPRAP IN A MANNER TO PREVENT DAMAGE TO THE STONE FILTER BLANKET OR GEOTEXTILE. HAND PLACE TO THE EXTENT NECESSARY.
- WHERE NO ENDWALL IS USED, CONSTRUCT THE UPSTREAM END OF THE APRON SO THAT THE WIDTH IS TWO TIMES THE DIAMETER OF THE OUTLET PIPE, AND EXTEND THE STONE UNDER THE OUTLET BY A MINIMUM OF 18 INCHES.
- CONSTRUCT APRON WITH 0% SLOPE ALONG ITS LENGTH AND WITHOUT OBSTRUCTIONS. PLACE STONE SO THAT IT BLENDS IN WITH EXISTING GROUND.
- MAINTAIN LINE, GRADE, AND CROSS SECTION. KEEP OUTLET FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AFTER HIGH FLOWS INSPECT FOR SCOUR AND DISLODGED RIPRAP. MAKE NECESSARY REPAIRS IMMEDIATELY.

DETAIL D-3-1 RIPRAP INFLOW PROTECTION

CONSTRUCTION SPECIFICATIONS

- PROVIDE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, UNDER THE BOTTOM AND ALONG SIDES OF ALL RIPRAP.
- CONSTRUCT INFLOW CHANNEL WITH CLASS I RIPRAP OR EQUIVALENT RECYCLED CONCRETE LINING TO A MINIMUM DEPTH OF 18 INCHES (2 x D₉₀) AND A 1 FOOT DEEP FLOW CHANNEL INFLOW RIPRAP PROTECTION CHANNEL MUST HAVE A TRAPEZOIDAL CROSS SECTION WITH 2:1 OR FLATTER SIDE SLOPES AND A 4 FOOT MINIMUM BOTTOM WIDTH.
- INSTALL ENTRANCE AND EXIT SECTIONS AS SHOWN ON THE PROFILE.
- BLEND RIPRAP INTO EXISTING GROUND.
- MAINTAIN LINE, GRADE, AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. KEEP POINTS OF INFLOW AND OUTFLOW FREE OF EROSION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

DETAIL E-3 SUPER SILT FENCE

CONSTRUCTION SPECIFICATIONS

- INSTALL 2 1/2 INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
- FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2 1/2 INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
- FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
- WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
- EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
- PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
- REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

DETAIL E-9-2 AT-GRADE INLET PROTECTION

CONSTRUCTION SPECIFICATIONS

- USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
- LIFT GRATE AND WRAP WITH NONWOVEN GEOTEXTILE TO COMPLETELY COVER ALL OPENINGS. SECURE WITH WIRE TIES AND SET GRATE BACK IN PLACE.
- PLACE CLEAN 3/4 TO 1 1/2 INCH STONE OR EQUIVALENT RECYCLED CONCRETE 6 INCHES THICK ON THE GRATE.
- STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

DETAIL E-1 SILT FENCE

CONSTRUCTION SPECIFICATIONS

- USE WOOD POSTS 1 1/2 X 1 1/2 X 3/8 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
- USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
- USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
- PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
- EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
- WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
- EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
- REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

DETAIL E-1 SILT FENCE

CONSTRUCTION SPECIFICATIONS

- USE WOOD POSTS 1 1/2 X 1 1/2 X 3/8 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
- USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
- USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
- PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
- EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
- WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
- EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
- REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

DETAIL E-1 SILT FENCE

CONSTRUCTION SPECIFICATIONS

- USE WOOD POSTS 1 1/2 X 1 1/2 X 3/8 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
- USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
- USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
- PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
- EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
- WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
- EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
- REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE 2011 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

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DISPOSITION OF BARS DETAIL

OPENING	AREA	B	C	E	F	G	H	J	K	L	M	N	D	STEEL	REQ.
48	12.57	1'-4"	10"	3'-2"	2'-8"	7'-0"	5'-0"	4'-10"	6'-3 1/2"	5'-8"	5'-9"	2'-10 1/2"	5'-6"	4.3	262
54	15.09	1'-4"	10"	3'-2"	2'-8"	7'-0"	5'-0"	4'-10"	6'-3 1/2"	5'-8"	5'-9"	2'-10 1/2"	5'-6"	5.0	300
60	18.64	1'-4"	10"	3'-2"	2'-8"	7'-0"	5'-0"	4'-10"	6'-3 1/2"	5'-8"	5'-9"	2'-10 1/2"	5'-6"	6.0	361

QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY

Maryland Department of Transportation STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES
STANDARD HEADWALLS B-48 B-54 B-60
STANDARD NO. MD 352.01

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division

Date: 2/3/22

Chief, Division of Land Development

Date: 2/3/22

RK&K
RUMMEL, KLEPPER & KRAIL, LLP
700 East Pratt Street, Suite 500
Baltimore, MD 21202
PH: 410.728.2900
www.rkk.com

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, MATTHEW THOMASSON LICENSE NO. 41799, EXPIRATION DATE: APRIL 12, 2022.

DESIGN BY: CWWW / ZWB

DRAWN BY: ZWB

CHECKED BY: MBT

DATE: 12/17/2021

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

3430 COURT HOUSE DRIVE ELLICOTT CITY, MD 21043-4300

OWNER/DEVELOPER

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

3430 COURT HOUSE DRIVE ELLICOTT CITY, MD 21043-4300

EROSION & SEDIMENT CONTROL DETAILS I

HOWARD COUNTY - DEPARTMENT OF PUBLIC WORKS

PUBLIC SAFETY TRAINING CENTER

RANGE IMPROVEMENTS

2200 SCOTT WHEELER DRIVE, MARIOTTVILLE, MD 21104
TAX MAP: 0016 PARCEL: 0253 GRID: 0068 ZONED: EXEMPT
ELECTION DISTRICT 3 - HOWARD COUNTY, MARYLAND
SHEET 79 OF 81

C-350

RK&K PROJECT NUMBER 17240.015

SCALE: As Shown

NOV 08 2022

SDP-110 / GP-21-142

DETAIL B-3-2 SERRATED SLOPE

STANDARD SYMBOL

TYPICAL SECTION

OVERLAND FLOW DIVERSION
NO STEEPER THAN 1.5:1 IN RIPABLE ROCK
NO STEEPER THAN 2:1 FOR NON RIPABLE SURFACES

CONSTRUCTION SPECIFICATIONS

- DIVERT OVERLAND FLOW FROM THE TOP OF ALL SERRATED CUT SLOPES AND CARRY TO A SUITABLE OUTLET.
- MAKE SERRATIONS AS THE EXCAVATION PROGRESSES.
- CONSTRUCT EACH STEP OR SERRATION ON THE CONTOUR. RISE & RUN DIMENSIONS WILL VARY DEPENDING ON THE FINAL SLOPE RATIO. FOR RIPABLE ROCK SURFACES, MAKE TWO FOOT VERTICAL (RISE) AND THREE FOOT HORIZONTAL (RUN) SERRATIONS AT A SLOPE RATIO NO STEEPER THAN 1.5:1. FOR NON RIPABLE SURFACES, MAKE TWO FOOT VERTICAL (RISE) AND FOUR FOOT HORIZONTAL (RUNS) SERRATIONS AT A SLOPE RATIO NO STEEPER THAN 2:1.
- KEEP ALL BENCHES FREE OF SEDIMENT DURING ALL PHASES OF CONSTRUCTION.
- HANDLE SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION IN ACCORDANCE WITH SECTION H-2 SUBSURFACE DRAINS OR OTHER APPROVED METHODS.
- MAINTAIN LINE, GRADE, AND CROSS SECTION OF SERRATED SLOPES. TEMPORARILY OR PERMANENTLY STABILIZE ALL GRADED, NON ROCK SURFACES IN ACCORDANCE WITH THE 3/7 DAY STABILIZATION REQUIREMENTS OR AS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN. CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

DETAIL C-1 EARTH DIKE

STANDARD SYMBOL A-1

CROSS SECTION

2:1 SLOPE OR FLATTER
EXISTING GROUND
GRADE TO PROVIDE REQUIRED FLOW WIDTH AND FLOW DEPTH

DIKE TYPE

	A	B
a - DIKE HEIGHT	18 IN MIN.	30 IN MIN.
b - DIKE WIDTH	24 IN MIN.	36 IN MIN.
c - FLOW WIDTH	4 FT MIN.	6 FT MIN.
d - FLOW DEPTH	12 IN MIN.	24 IN MIN.

PLAN VIEW

CONTINUOUS GRADE 0.5% MIN. TO 10% MAX. SLOPE

FLOW CHANNEL STABILIZATION

A-1 SEED WITH STRAW MULCH AND TACK. (NOT ALLOWED FOR CLEAR WATER DIVERSION.)
A-2/B-2 SEED WITH SOIL STABILIZATION MATTING OR LINE WITH SOD.
A-3/B-3 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE PRESSED INTO SOIL A MINIMUM OF 7 INCHES AND FLUSH WITH GROUND.

CONSTRUCTION SPECIFICATIONS

- REMOVE AND DISPOSE OF ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SO AS NOT TO INTERFERE WITH PROPER FUNCTION OF EARTHDIKE.
- EXCAVATE OR SHAPE EARTH DIKE TO LINE, GRADE, AND CROSS SECTION AS SPECIFIED. BANK PROJECTIONS OR OTHER IRREGULARITIES ARE NOT ALLOWED.
- COMPACT FILL.
- CONSTRUCT FLOW CHANNEL ON AN UNINTERRUPTED, CONTINUOUS GRADE, ADJUSTING THE LOCATION DUE TO FIELD CONDITIONS AS NECESSARY TO MAINTAIN POSITIVE DRAINAGE.
- PROVIDE OUTLET PROTECTION AS REQUIRED ON APPROVED PLAN.
- STABILIZE EARTH DIKE WITHIN THREE DAYS OF INSTALLATION. STABILIZE FLOW CHANNEL FOR CLEAR WATER DIVERSION WITHIN 24 HOURS OF INSTALLATION.
- MAINTAIN LINE, GRADE, AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS, AND MAINTAIN POSITIVE DRAINAGE. KEEP EARTH DIKE AND POINT OF DISCHARGE FREE OF EROSION, AND CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.
- UPON REMOVAL OF EARTH DIKE, GRADE AREA FLUSH WITH EXISTING GROUND. WITHIN 24 HOURS OF REMOVAL STABILIZE DISTURBED AREA WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED ON APPROVED PLAN.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

DETAIL E-8 TEMPORARY GABION OUTLET STRUCTURE

STANDARD SYMBOL TGOS

ELEVATION

MAXIMUM DRAINAGE AREA = 1/2 ACRE
TIE-IN (SEE EARTH DIKE TRANSITION DETAIL ON 2 OF 2)
GRADE AT FRONT AND BACK FACE OF WALL
6 FT
9 IN GABION MATTRESS
9 IN GABION MATTRESS
TIE-IN
1 FT* MIN.
WEIR CREST
9 IN
NONWOVEN GEOTEXTILE
9 IN MIN. TYP.
ATTACH WOVEN MONOFILAMENT GEOTEXTILE TO THE UPSTREAM FACE OF ALL GABION BASKETS.

PLAN

PLACE WOVEN MONOFILAMENT GEOTEXTILE ON UPSTREAM FACE OF GABION BASKET PRIOR TO BACKFILL FASTEN SECURELY WITH TIES SPACED EVERY 20 IN AT THE TOP AND MID-SECTION.
4 TO 7 IN STONE
WEIR CREST
3 FT
CHANNEL BOTTOM
NONWOVEN GEOTEXTILE
MIN. GABION BASKETS TYPICAL DIMENSIONS 6 FT x 3 FT x 3 FT
EMBED WOVEN MONOFILAMENT GEOTEXTILE 9 IN MIN. INTO GROUND

SECTION A-A

1 OF 2

CONSTRUCTION SPECIFICATIONS

- PROVIDE STORAGE VOLUME AS SPECIFIED ON APPROVED PLANS.
- USE BASKETS MADE OF 11 GAUGE WIRE OR HEAVIER.
- USE NONWOVEN AND WOVEN MONOFILAMENT GEOTEXTILES AS SPECIFIED IN SECTION H-1 MATERIALS.
- INSTALL GABIONS IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
- EMBED THE GABION OUTLET STRUCTURE INTO THE SOIL A MINIMUM OF 9 INCHES. PROVIDE NONWOVEN GEOTEXTILE UNDER ALL GABIONS.
- FILL GABION BASKETS WITH CLEAN 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE WITHOUT REBAR OR WIRE MESH.
- MAKE THE WEIR CREST OF THE GABION OUTLET STRUCTURE 9 INCHES LOWER THAN THE TOP OF THE ADJACENT GABIONS.
- PROVIDE A MINIMUM WEIR CREST OF 6 FEET.
- ATTACH WOVEN MONOFILAMENT GEOTEXTILE TO THE UPSTREAM FACE OF GABION BASKETS AND COVER WITH 4 TO 7 INCH STONE.
- REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO WITHIN 12 INCHES OF THE WEIR CREST. REPLACE GEOTEXTILE AND STONE FACING WHEN STRUCTURE CEASES TO FUNCTION. MAINTAIN LINE, GRADE, AND CROSS SECTION.
- UPON REMOVAL OF GABION OUTLET STRUCTURE, GRADE AREA FLUSH WITH EXISTING GROUND. WITHIN 24 HOURS STABILIZE DISTURBED AREA WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED ON APPROVED PLAN.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

DETAIL E-8 TEMPORARY GABION OUTLET STRUCTURE

STANDARD SYMBOL TGOS

EARTH DIKE TRANSITION

TOP OF ADJOINING EARTH DIKE
TRANSITION EARTH DIKE
1 FT MIN.
TIE-IN
GRADE EARTH DIKE INTO FACE OF WALL
EX. GROUND
4 IN MIN.
18 IN TYPE 'A' DIKE OR 30 IN TYPE 'B' DIKE

CONSTRUCTION SPECIFICATIONS

- PROVIDE TRANSITION LENGTH AND HEIGHT AS SPECIFIED ON PLAN. HEIGHT OF TRANSITION EARTH DIKE MUST EXCEED 4 INCH MINIMUM FREEBOARD ABOVE TOP OF GABION AND EXTEND AT THIS ELEVATION UNTIL IT INTERCEPTS THE TOP OF ADJOINING EARTH DIKE.
- PROVIDE POSITIVE DRAINAGE ALONG EARTH DIKE TO GABION OUTLET STRUCTURE.
- COMPACT FILL.
- SHAPE EARTH DIKE TO LINE, GRADE, AND CROSS SECTION AS SPECIFIED ON PLAN. BANK PROJECTIONS OR IRREGULARITIES ARE NOT ALLOWED.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

DISPOSITION OF BARS DETAIL

PLAN

4-NO. 4 STRAIGHT BARS VERTICAL IN FRONT FACE FOR 12" DIA. TO 21" DIA. PIPE ENDWALLS INCLUSIVE.
2-NO. 4 STRAIGHT BARS HORIZONTAL 1 EACH FACE FOR 36" DIA. TO 72" DIA. PIPE ENDWALLS INCLUSIVE.
2-NO. 4 STRAIGHT BARS VERTICAL 1 EACH FACE FOR 36" DIA. TO 72" DIA. PIPE ENDWALLS INCLUSIVE.

SECTION A-A

4-NO. 4 STRAIGHT BARS HORIZONTAL 1-1" MIN. C/C BOTH FACES- TOP AND BOTTOM BARS TO BE FULL LENGTH. NO. 4 BENT BARS 1-1" MIN. C/C ALL ENDWALLS.
2-NO. 4 STRAIGHT BARS HORIZONTAL FOR 36" DIA. TO 72" DIA. PIPE ENDWALLS INCLUSIVE.
1-NO. 4 STRAIGHT BAR HORIZONTAL 1-1" MIN. C/C BOTH SIDES OF OPENING FOR 36" DIA. TO 72" DIA. PIPE ENDWALLS INCLUSIVE.

QUANTITIES FOR ESTIMATING PURPOSES ONLY

OPENING DIMENSIONS (INCHES)	CONC. STEEL C.Y.	CONC. STEEL C.Y. (LBS.)
12	0.28	82
15	0.39	112
18	0.50	142
21	0.61	172
24	0.72	202
27	0.83	232
30	0.94	262
33	1.05	292
36	1.16	322
42	1.44	392
48	1.72	462
54	2.00	532
60	2.28	602
66	2.56	672
72	2.84	742

'S' DISTANCES

4" FOR 12" DIA. TO 21" DIA. PIPES INCLUSIVE.
6" FOR 24" DIA. TO 36" DIA. PIPES INCLUSIVE.
8" FOR 42" DIA. TO 72" DIA. PIPES INCLUSIVE.

GENERAL NOTES

SPECIFICATIONS: LATEST S.H.A.
CONCRETE SHALL BE MIX NO. 2
REINFORCING: DEFORMED STEEL BARS-NO. 4
CHAMFER: ALL EXPOSED EDGES 1"x1" OR AS DIRECTED

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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TREE PROTECTION FENCE - HIGH VISIBILITY ORANGE FENCE

TYPICAL SECTION - GEOTEXTILE INCLUSIONS (NOT TO SCALE)

EXISTING TREES TO REMAIN
GALVANIZED PIPE CHAIN-LINK SUPPORT AT 10' O.C. MAXIMUM
HIGHLY VISIBLE FLAGGING
ORANGE HIGH VISIBILITY SAFETY FENCING
TREE PROTECTION SIGNS- 100' O.C. (MINIMUM ONE SIGN PER TREE PROTECTION AREA)
ANCHOR POSTS MUST BE INSTALLED TO A DEPTH OF NO LESS THAN 1/3 OF THE TOTAL HEIGHT OF POST
EXISTING GRADE
MIN. 4'-0"

NOTES:

- TREE PROTECTION FENCING SHALL BE INSTALLED ALONG THE BOUNDARY OF ALL FOREST CONSERVATION EASEMENTS BORDERING THE LOD.
- BOUNDARIES OF FOREST CONSERVATION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICE.
- ROOT DAMAGE SHOULD BE AVOIDED.
- DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION
- WHERE COMBINED SUPER SILT FENCE/ TREE PROTECTION FENCE IS SPECIFIED INSTALL SUPER SILT FENCE PER DETAIL, EXCEPT, APPLY TREE PROTECTION SIGN TO SUPER SILT FENCE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

TYPICAL SECTION - SLOPE REPAIR (NOT TO SCALE)

4" FURNISHED TOP SOIL WITH TURF GRASS ESTABLISHMENT AND TYPE B SOIL STABILIZATION MATTING
PROPOSED EMBANKMENT AS INDICATED ON FINISH GRADE PLANS C-201
CLASS SE TYPE II GEOTEXTILE (NON-WOVEN) PLACED CONTINUOUSLY TO THE TOP OF THE SLOPE
TOE OF SLOPE
1.75:1 (MAX)
6'
6'
6'
TYPE B SOIL STABILIZATION MATTING WITH 4" TOPSOIL, SEED, & MULCH
GEOTEXTILE CLASS SE TYPE II NON-WOVEN
BENCH IN ACCORDANCE WITH SECTION 204.04.03 OF THE HOWARD COUNTY STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION, 2017, VOLUME IV.
RESTORE EXISTING GROUND
SELECT BACKFILL
1.75:1 (MAX)
EXISTING TOE OF SLOPE

NOTES:

- SEE GEOTECHNICAL NOTES ON SHEET C-300 FOR REPAIR/RESTORATION OF EXISTING SLOPE. NOTES 7 & 8 ON C-300 ARE NOT RELEVANT FOR REPAIR/RESTORATION.

Howard SCD Signature Block:
This plan is approved for soil erosion and sediment control by the Howard Soil Conservation District.
Date: 1/12/22

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

DETAIL E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL SIP

TYPICAL SECTION

TYPE A MAXIMUM DRAINAGE AREA = 1/4 ACRE
TYPE B MAXIMUM DRAINAGE AREA = 1 ACRE
GALVANIZED HARDWARE CLOTH
2 IN X 4 IN FRAMING
TOP ELEVATION
16 IN MIN. NOTCH ELEVATION
18 IN
12 IN
WOVEN SLIT FILM GEOTEXTILE
9 GAUGE CHAIN LINK FENCE (TYP.)
18 IN INTO GROUND
TYPE A
TYPE B
ISOMETRIC VIEW
EDGE OF ROADWAY OR TOP OF EARTH DIKE
6 IN MIN.
FLOW
FLOW
POST DRIVEN INTO GROUND
EXCAVATE, BACKFILL AND COMPACT EARTH (TYP.)
SECTION FOR TYPE A AND B

CONSTRUCTION SPECIFICATIONS

- USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
- EXCAVATE COMPLETELY AROUND THE INLET TO A DEPTH OF 18 INCHES BELOW THE NOTCH ELEVATION.
- FOR TYPE A, USE NOMINAL 2 INCH X 4 INCH CONSTRUCTION GRADE LUMBER POSTS, DRIVEN 1 FOOT INTO THE GROUND AT EACH CORNER OF THE INLET. PLACE NAIL STRIPS BETWEEN THE POSTS ON THE ENDS OF THE INLET. ASSEMBLE THE TOP PORTION OF THE 2X4 FRAME AS SHOWN. STRETCH 1/2 INCH GALVANIZED HARDWARE CLOTH TIGHTLY AROUND THE FRAME AND FASTEN SECURELY. FASTEN GEOTEXTILE SECURELY TO THE HARDWARE CLOTH WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND HARDWARE CLOTH A MINIMUM OF 18 INCHES BELOW THE WEIR CREST. THE ENDS OF THE GEOTEXTILE MUST MEET AT A POST, BE OVERLAPPED AND FOLDED, THEN FASTENED TO THE POST.
- FOR TYPE B, USE 2 3/8 INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND 6 FOOT LENGTH, DRIVEN A MINIMUM OF 36 INCHES BELOW THE WEIR CREST AT EACH CORNER OF THE STRUCTURE. FASTEN 9 GAUGE OR HEAVIER CHAIN LINK FENCE, 42 INCHES IN HEIGHT, SECURELY TO THE FENCE POSTS WITH WIRE TIES. FASTEN GEOTEXTILE SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 18 INCHES BELOW THE WEIR CREST.
- BACKFILL AROUND THE INLET IN LOOSE 4 INCH LIFTS AND COMPACT UNTIL SOIL IS LEVEL WITH THE NOTCH ELEVATION ON THE ENDS AND TOP ELEVATION ON THE SIDES.
- STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Date: 2/3/22
Date: 2/3/22

RK&K
RUMMEL, KLEPPER & KAHN, LLP
700 East Pratt Street, Suite 500
Baltimore, MD 21202
PH: 410.728.2000
www.rkk.com

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, MATTHEW THOMASSON LICENSE NO. 41799, EXPIRATION DATE: APRIL 12, 2022.

DESIGN BY: CWWW / ZWB
DRAWN BY: ZWB
CHECKED BY: MBT
DATE: 12/17/2021

RK&K 1 FIRING RANGE BERM RE-GRADING

BY NO. REVISION DATE

OWNER/DEVELOPER
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
3430 COURT HOUSE DRIVE
ELLCOTT CITY, MD 21043-4300

EROSION & SEDIMENT CONTROL DETAILS
HOWARD COUNTY - DEPARTMENT OF PUBLIC WORKS
PUBLIC SAFETY TRAINING CENTER
RANGE IMPROVEMENTS
2200 SCOTT WHEELER DRIVE, MARRIOTTVILLE, MD 21104
TAX MAP: 0016 PARCEL: 0253 GRID: 0006 ZONED: EXEMPT
ELECTION DISTRICT 2 - HOWARD COUNTY, MARYLAND
SHEET 80 OF 81

C-351
RK&K PROJECT NUMBER 17240.015
SCALE: As Shown

RECEIVED
NOV 08 2022
LICENSED PROFESSIONAL ENGINEER

SDP-96-110 / GP-21-142

B-4 STANDARDS AND SPECIFICATIONS

FOR
VEGETATIVE STABILIZATION

Definition
Using vegetation as cover to protect exposed soil from erosion.

Purpose
To promote the establishment of vegetation on exposed soil.

Conditions Where Practice Applies
On all disturbed areas not stabilized by other methods. This specification is divided into sections on incremental stabilization, soil preparation, soil amendments and topsoiling, seeding and mulching, temporary stabilization, and permanent stabilization.

Effects on Water Quality and Quantity
Stabilization practices are used to promote the establishment of vegetation on exposed soil. When soil is stabilized with vegetation, the soil is less likely to erode and more likely to allow infiltration of rainfall, thereby reducing sediment loads and runoff to downstream areas.

Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, percolation, and groundwater recharge. Over time, vegetation will increase organic matter content and improve the water holding capacity of the soil and subsequent plant growth.

Vegetation will help reduce the movement of sediment, nutrients, and other chemicals carried by runoff to receiving waters. Plants will also help protect groundwater supplies by assimilating these substances present within the root zone.

Sediment control practices must remain in place during grading, seedbed preparation, seeding, mulching, and vegetative establishment.

Adequate Vegetative Establishment
Inspect seeded areas for vegetative establishment and make necessary repairs, replacements, and reseedings within the planting season.

- Adequate vegetative stabilization requires 95 percent groundcover.
- If an area has less than 40 percent groundcover, restabilize following the original recommendations for lime, fertilizer, seedbed preparation, and seeding.
- If an area has between 40 and 94 percent groundcover, over-seed and fertilize using half of the rates originally specified.
- Maintenance fertilizer rates for permanent seeding are shown in Table B.6.

and seedbed preparation.

C. Soil Amendments (Fertilizer and Lime Specifications)

- Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more. Soil analysis may be performed by a recognized private or commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses.
- Fertilizers must be uniform in composition, free flowing and suitable for accurate application by appropriate equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers must all be delivered to the site fully labeled according to the applicable laws and must bear the name, trade name or trademark and warranty of the producer.
- Lime materials must be ground limestone (hydrated or burnt lime may be substituted except when hydroseeding) which contains at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone must be ground to such fineness that at least 50 percent will pass through a #100 mesh sieve and 98 to 100 percent will pass through a #20 mesh sieve.
- Lime and fertilizer are to be evenly distributed and incorporated into the top 3 to 5 inches of soil by disking or other suitable means.
- Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil.

B-4-3 STANDARDS AND SPECIFICATIONS

FOR
SEEDING AND MULCHING

Definition
The application of seed and mulch to establish vegetative cover.

Purpose
To protect disturbed soils from erosion during and at the end of construction.

Conditions Where Practice Applies
To the surface of all perimeter controls, slopes, and any disturbed area not under active grading.

Criteria

A. Seeding

- Specifications
 - All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to Table B.4 regarding the quality of seed. Seed tags must be available upon request to the inspector to verify type of seed and seeding rate.
 - Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. The appropriate seeding mixture must be applied when the ground thaws.
 - Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.
 - Sod or seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phytotoxic materials.
- Application
 - Dry Seeding: This includes use of conventional drop or broadcast spreaders.
 - Incorporate seed into the subsoil at the rates prescribed on Temporary Seeding Table B.1, Permanent Seeding Table B.3, or site-specific seeding summaries.
 - Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Roll the seeded area with a weighted roller to provide good seed to soil contact.

Howard SCD Signature Block:

This plan is approved for soil erosion and sediment control by the Howard Soil Conservation District.

[Signature] Date: 1/10/22
[Signature] Date: 2/1/22
[Signature] Date: 2/13/22

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division
 Chief, Division of Land Development
 Director

B-4-1 STANDARDS AND SPECIFICATIONS

FOR
INCREMENTAL STABILIZATION

Definition
Establishment of vegetative cover on cut and fill slopes.

Purpose
To provide timely vegetative cover on cut and fill slopes as work progresses.

Conditions Where Practice Applies
Any cut or fill slope greater than 15 feet in height. This practice also applies to stockpiles.

Criteria

A. Incremental Stabilization - Cut Slopes

- Excavate and stabilize cut slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all cut slopes as the work progresses.
- Construction sequence example (Refer to Figure B.1):
 - Construct and stabilize all temporary swales or dikes that will be used to convey runoff around the excavation.
 - Perform Phase 1 excavation, prepare seedbed, and stabilize.
 - Perform Phase 2 excavation, prepare seedbed, and stabilize. Overseed Phase 1 areas as necessary.
 - Perform final phase excavation, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.

Note: Once excavation has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.

Figure B.1: Incremental Stabilization - Cut

B. Mulching

- Mulch Materials (in order of preference)
 - Straw consisting of thoroughly threshed wheat, rye, oat, or barley and reasonably bright in color. Straw is to be free of noxious weed seeds as specified in the Maryland Seed Law and not musty, moldy, caked, decayed, or excessively dusty. **Note: Use only sterile straw mulch in areas where one species of grass is desired.**
 - Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state.
 - WCFM is to be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
 - WCFM, including dye, must contain no germination or growth inhibiting factors.
 - WCFM materials are to be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material must form a batter-like ground cover, on application, having moisture absorption and percolation properties and must cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
 - WCFM material must not contain elements or compounds at concentration levels that will be phytotoxic.
 - WCFM must conform to the following physical requirements: fiber length of approximately 10 millimeters, diameter approximately 1 millimeter, pH range of 4.0 to 8.5, ash content of 1.6 percent maximum and water holding capacity of 90 percent minimum.
- Application
 - Apply mulch to all seeded areas immediately after seeding.
 - When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution and depth so that the soil surface is not exposed. When using a mulch anchoring tool, increase the application rate to 2.5 tons per acre.
 - Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 pounds per acre. Mix the wood cellulose fiber with water to attain a mixture with a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
- Anchoring
 - Perform mulch anchoring immediately following application of mulch to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon the size of the area and erosion hazard:
 - A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of 2 inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should follow the contour.
 - Wood cellulose fiber may be used for anchoring straw. Apply the fiber binder at a net dry weight of 750 pounds per acre. Mix the wood cellulose fiber with water at a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
 - Synthetic binders such as Acrylic DLR (Agro-Tack), DCA-70, Petrosol, Terra Tax II, Terra Tack AR or other approved equal may be used. Follow application rates as specified by the manufacturer. Application of liquid binders needs to be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. **Use of asphalt binders is strictly prohibited.**
 - Lightweight plastic netting may be stapled over the mulch according to manufacturer recommendations. Netting is usually available in rolls 4 to 15 feet wide and 300 to 3,000 feet long.

B-4-4 STANDARDS AND SPECIFICATIONS

FOR
TEMPORARY STABILIZATION

Definition
To stabilize disturbed soils with vegetation for up to 6 months.

Purpose
To use fast growing vegetation that provides cover on disturbed soils.

Conditions Where Practice Applies
Exposed soils where ground cover is needed for a period of 6 months or less. For longer duration of time, permanent stabilization practices are required.

Criteria

- Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant Hardiness Zone (from Figure B.3), and enter them in the Temporary Seeding Summary below along with application rates, seeding dates and seeding depths. If this Summary is not put on the plan and completed, then Table B.1 plus fertilizer and lime rates must be put on the plan.
- For sites having soil tests performed, use and show the recommended rates by the testing agency. Soil tests are not required for Temporary Seeding.
- When stabilization is required outside of a seeding season, apply seed and mulch or straw mulch alone as prescribed in Section B-4-3.A.1.b and maintain until the next seeding season.

Temporary Seeding Summary

Hardiness Zone (from Figure B.3): 7a				Fertilizer Rate (10-20-30)	Lime Rate
No.	Species	Application Rate (lb/ac)	Seeding Dates		
	Festuca pratensis	30	Feb 15-Apr 30 Aug 15-Nov 30	436 lb/ac (10 lb/1000 sf)	2 tons/ac (90 lb/1000 sf)
	Annual ryegrass	40	May 1 - August 14		

PROFESSIONAL CERTIFICATION

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. MATTHEW THOMASSON. LICENSE NO. 41799. EXPIRATION DATE: APRIL 12, 2022.

[Signature]

B. Incremental Stabilization - Fill Slopes

- Construct and stabilize fill slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all slopes as the work progresses.
- Stabilize slopes immediately when the vertical height of a lift reaches 15 feet, or when the grading operation ceases as prescribed in the plans.
- At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
- Construction sequence example (Refer to Figure B.2):
 - Construct and stabilize all temporary swales or dikes that will be used to divert runoff around the fill. Construct silt fence on low side of fill unless other methods shown on the plans address this area.
 - At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
 - Place Phase 1 fill, prepare seedbed, and stabilize.
 - Place Phase 2 fill, prepare seedbed, and stabilize.
 - Place final phase fill, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.

Note: Once the placement of fill has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.

Figure B.2: Incremental Stabilization - Fill

B-4-2 STANDARDS AND SPECIFICATIONS

FOR
SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

Definition
The process of preparing the soils to sustain adequate vegetative stabilization.

Purpose
To provide a suitable soil medium for vegetative growth.

Conditions Where Practice Applies
Where vegetative stabilization is to be established.

Criteria

A. Soil Preparation

- Temporary Stabilization
 - Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
 - Apply fertilizer and lime as prescribed on the plans.
 - Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
- Permanent Stabilization
 - A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
 - Soil pH between 6.0 and 7.0.
 - Soluble salts less than 500 parts per million (ppm).
 - Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: if legumines will be planted, then a sandy soil (less than 30 percent silt plus clay) would be acceptable.
 - Soil contains 1.5 percent minimum organic matter by weight.
 - Soil contains sufficient pore space to permit adequate root penetration.
 - Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
 - Graded areas must be maintained in a true and even grade as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.

B-4-2 STANDARDS AND SPECIFICATIONS

FOR
PERMANENT STABILIZATION

Definition
To stabilize disturbed soils with permanent vegetation.

Purpose
To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.

Conditions Where Practice Applies
Exposed soils where ground cover is needed for 6 months or more.

Criteria

A. Seed Mixtures

- General Use
 - Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The Summary is to be placed on the plan.
 - Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Field Office Guide, Section 342 - Critical Area Planting.
 - For sites having disturbed area over 5 acres, use and show the rates recommended by the soil testing agency.
 - For areas receiving low maintenance, apply urea from fertilizer (46-0-0) at 3 1/4 pounds per 1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary.
- Turfgrass Mixtures
 - Areas where turfgrasses may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
 - Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
 - Kentucky Bluegrass: Full Sun Mixture: For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a minimum of three Kentucky Bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
 - Kentucky Bluegrass/Perennial Ryegrass: Full Sun Mixture: For use in full sun areas where

SHA TURFGRASS SEED MIX

Hardiness Zone (from Figure B.3): 7a				Fertilizer Rate (10-20-20)			Lime Rate
No.	Species	Application Rate (lb/ac)	Seeding Dates	N	P ₂ O ₅	K ₂ O	
	Turf-Type Tall Fescue (Sovereign) (Dumort. Non-ovine)	95	2/15 to 4/30 8/15 to 10/31	45 lb/ac (1.0 lb/1000 sf)	80 lb/ac (2.0 lb/1000 sf)	80 lb/ac (2.0 lb/1000 sf)	90 lb/ac (2.25 lb/1000 sf)
	Kentucky Bluegrass (Plus perennial L. top grasses)	5	2/15 to 4/30 8/15 - 10/31				

DESIGN BY: CWWM / ZWB
 DRAWN BY: ZWB
 CHECKED BY: MBT
 DATE: 12/17/2021

BY NO. REVISION DATE

B-4-2 STANDARDS AND SPECIFICATIONS

FOR
SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

Definition
The process of preparing the soils to sustain adequate vegetative stabilization.

Purpose
To provide a suitable soil medium for vegetative growth.

Conditions Where Practice Applies
Where vegetative stabilization is to be established.

Criteria

A. Soil Preparation

- Temporary Stabilization
 - Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
 - Apply fertilizer and lime as prescribed on the plans.
 - Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
- Permanent Stabilization
 - A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
 - Soil pH between 6.0 and 7.0.
 - Soluble salts less than 500 parts per million (ppm).
 - Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: if legumines will be planted, then a sandy soil (less than 30 percent silt plus clay) would be acceptable.
 - Soil contains 1.5 percent minimum organic matter by weight.
 - Soil contains sufficient pore space to permit adequate root penetration.
 - Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
 - Graded areas must be maintained in a true and even grade as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.

B-4-2 STANDARDS AND SPECIFICATIONS

FOR
PERMANENT STABILIZATION

Definition
To stabilize disturbed soils with permanent vegetation.

Purpose
To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.

Conditions Where Practice Applies
Exposed soils where ground cover is needed for 6 months or more.

Criteria

A. Seed Mixtures

- General Use
 - Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The Summary is to be placed on the plan.
 - Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Field Office Guide, Section 342 - Critical Area Planting.
 - For sites having disturbed area over 5 acres, use and show the rates recommended by the soil testing agency.
 - For areas receiving low maintenance, apply urea from fertilizer (46-0-0) at 3 1/4 pounds per 1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary.
- Turfgrass Mixtures
 - Areas where turfgrasses may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
 - Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
 - Kentucky Bluegrass: Full Sun Mixture: For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a minimum of three Kentucky Bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
 - Kentucky Bluegrass/Perennial Ryegrass: Full Sun Mixture: For use in full sun areas where

B-4-2 STANDARDS AND SPECIFICATIONS

FOR
PERMANENT STABILIZATION

Definition
To stabilize disturbed soils with permanent vegetation.

Purpose
To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.

Conditions Where Practice Applies
Exposed soils where ground cover is needed for 6 months or more.

Criteria

A. Seed Mixtures

- General Use
 - Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The Summary is to be placed on the plan.
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 - Areas where turfgrasses may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
 - Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
 - Kentucky Bluegrass: Full Sun Mixture: For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a minimum of three Kentucky Bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
 - Kentucky Bluegrass/Perennial Ryegrass: Full Sun Mixture: For use in full sun areas where

SHA TURFGRASS SEED MIX

Hardiness Zone (from Figure B.3): 7a				Fertilizer Rate (10-20-20)			Lime Rate
No.	Species	Application Rate (lb/ac)	Seeding Dates	N	P ₂ O ₅	K ₂ O	
	Turf-Type Tall Fescue (Sovereign) (Dumort. Non-ovine)	95	2/15 to 4/30 8/15 to 10/31	45 lb/ac (1.0 lb/1000 sf)	80 lb/ac (2.0 lb/1000 sf)	80 lb/ac (2.0 lb/1000 sf)	90 lb/ac (2.25 lb/1000 sf)
	Kentucky Bluegrass (Plus perennial L. top grasses)	5	2/15 to 4/30 8/15 - 10/31				

OWNER/DEVELOPER
 HOWARD COUNTY
 DEPARTMENT OF PUBLIC WORKS

3430 COURT HOUSE DRIVE
 ELLICOTT CITY, MD 21043-4300

B-4-2 STANDARDS AND SPECIFICATIONS

FOR
PERMANENT STABILIZATION

Definition
To stabilize disturbed soils with permanent vegetation.

Purpose
To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.

Conditions Where Practice Applies
Exposed soils where ground cover is needed for 6 months or more.

Criteria

A. Seed Mixtures

- General Use
 - Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The Summary is to be placed on the plan.
 - Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Field Office Guide, Section 342 - Critical Area Planting.
 - For sites having disturbed area over 5 acres, use and show the rates recommended by the soil testing agency.
 - For areas receiving low maintenance, apply urea from fertilizer (46-0-0) at 3 1/4 pounds per 1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary.
- Turfgrass Mixtures
 - Areas where turfgrasses may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
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EROSION & SEDIMENT CONTROL DETAILS III
 HOWARD COUNTY - DEPARTMENT OF PUBLIC WORKS
 PUBLIC SAFETY TRAINING CENTER

RANGE IMPROVEMENTS
 2200 SCOTT WHEELER DRIVE, MARRIOTTSVILLE, MD 21104
 TAX MAP 0018 PARCEL 0253 GRID 0008 ZONED EXEMPT
 ELECTION DISTRICT 3 - HOWARD COUNTY, MARYLAND
 SHEET 81 OF 81

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