SWC STANDARD OPERATING PROCEDURE

NCDA&CS Hurricane Helene Agricultural Disaster Recovery Program USDA Block Grant Infrastructure Loss Repairs to Roads, Bridges, Culverts

Soil Classification & Eligibility Determination Procedure | HBG-SOIL-001 | Version 2.1

Document Control

SOP Title	Helene Block Grant - Infrastructure Repair - Roads, Bridges, Culverts— Soils Evaluation SOP
SOP ID / Reference #	HBG-SOIL-001
Primary Section	Division of Soil Science / NCDA
Cross-Sectional SOP	Yes
Other Sections Involved	Block Grant Program Administration; Engineering (handoff only)
Operation / Topic	Soil classification and eligibility determination for road/trail repair under Helene Block Grant
Author(s)	[Division Soil Scientist Name(s)]
Date Created	[04/29/2026]
Effective Date	2026
Current Version	2.1
Last Review Date	[07/10/2026]
Approval Authority	Division Director / State Soil Scientist

1. Purpose

This SOP establishes the soil evaluation process for existing roads, trails, and access infrastructure submitted under the Hurricane Helene Block Grant Road Repair Program. It provides soil scientists with a consistent, defensible methodology for determining project eligibility based on soil classification, drainage class, bearing capacity, and NRCS practice standard criteria.

This SOP covers soil science determinations only. Engineering design, structural assessment, drainage structure sizing, and road geometry are outside the scope of this document and are the responsibility of a qualified engineer.

Eligibility is determined under one of two tracks:

Track 1 – NRCS Standard Repair: Soil conditions are consistent with NRCS CPS 560, 561, 578, and/or 655 standards. Documentation must confirm soil series, drainage class, USCS classification, and surface treatment appropriateness.

Track 2 – Alternative Repair: Soil conditions do not meet NRCS standards but a qualified soil scientist determines soils are stable and non-limiting for the current road/trail use.

2. Scope

This SOP applies to:

- All existing roads, trails, and access routes submitted for Helene Block Grant road repair funding in the western NC Helene-impacted area
- NCDA Division of Soil Science staff and contracted soil scientists conducting soil eligibility evaluations
- Projects triggered by a landowner, county, or partner agency submitting a road/trail for block grant review

This SOP does not govern:

- Engineering design or structural assessment of roads, culverts, or stream crossings
- Drainage structure sizing or road geometry
- Environmental or regulatory permitting
- Final grant award decisions (determination is advisory to the program administrator)

3. Definitions & Acronyms

Term / Acronym	Definition
CPS	Conservation Practice Standard (NRCS)
CPS 560	NRCS Access Road — criteria for established vehicular access routes
CPS 561	NRCS Heavy Use Area Protection — surface and subbase material requirements driven by soil bearing capacity
CPS 578	NRCS Stream Crossing — soil suitability for approaches, backfill, and scour potential at stream crossings
CPS 655	NRCS Forest Trails and Landings — criteria for temporary or infrequent forest routes
USCS	Unified Soil Classification System — engineering classification of soils by texture and plasticity
WSS	Web Soil Survey — NRCS online tool for mapped soil data, series descriptions, and road suitability interpretations
Bearing Capacity	The ability of a soil to support applied loads without failure or excessive deformation
Suitable (USCS)	Soil classification indicating adequate bearing capacity and stability for road/trail use without special treatment
Provisional (USCS)	Soil classification indicating marginal bearing capacity; road/trail use possible with appropriate surface treatment or geotextile
Not Suitable (USCS)	Soil classification indicating poor bearing capacity, high rutting or instability risk; road/trail siting should be avoided
Track 1	Eligibility pathway for roads/trails with soils meeting NRCS CPS standards

Term / Acronym	Definition
Track 2	Eligibility pathway for roads/trails with soils determined stable by professional soil science evaluation
NCDA	NC Department of Agriculture and Consumer Services
NRCS	Natural Resources Conservation Service (USDA)

4. Roles & Responsibilities

Role / Position	Responsibilities
Division Soil Scientist	Conducts all Track 1 and Track 2 soil evaluations. Responsible for WSS review, field verification, USCS determination, and documentation. Signs all soil eligibility determinations.
Block Grant Program Administrator	Routes submitted road/trail projects to Division Soil Scientist. Receives completed soil determination documentation. Assigns eligibility track. Maintains project files.
Landowner / Applicant	Provides site access. Supplies any available information on road construction history, materials used, or prior maintenance.
Engineer (external handoff)	Receives soil determination as input for engineering design where required. Engineering scope is outside this SOP.

5. Procedure

5.1 Triggering Event

A road or trail project is submitted for Helene Block Grant eligibility review. The block grant program administrator routes the project to the Division Soil Scientist, who initiates the soil evaluation process.

5.2 Step-by-Step Soil Evaluation Procedure

Field evaluations are documented using Form HBG-SOIL-001-FS

Step 1: Receive project referral. Confirm parcel location, road or trail description, and applicable NRCS practice standard(s) (CPS 560, 561, 578, and/or 655).

Step 2: Pull Web Soil Survey (WSS) area of interest for the project parcel. Document map unit, soil series, drainage class, and road/trail suitability interpretation for each relevant map unit.

Step 3: Conduct field site visit. Observe and document soil texture, structure, color, mottling, and drainage indicators. Confirm consistency with mapped soil series. Note any profile disturbance, fill material, or deviations from the mapped series.

Step 4: Determine USCS classification from field evaluation. Classify each soil as Suitable, Provisional, or Not Suitable per the USCS Suitability Reference Table in Section 6.

Step 5: Assess surface treatment appropriateness based on USCS classification and drainage class. Determine whether geotextile is indicated. Document finding. Do not specify engineering design — flag need for engineering referral if surface treatment is required.

Step 6: If stream crossings are present, evaluate approach and backfill soil suitability and scour potential per CPS 578 soil criteria. Flag for engineering referral if crossing soils are Provisional or Not Suitable.

Step 7: Work through the Track 1 soil criteria checklist (Section 8). Track 1 is evaluated first on every project. If all Track 1 criteria are met, the project is Track 1 eligible and Track 2 evaluation is not required. If any Track 1 criteria are not met, proceed to the Track 2 stability evaluation (Section 9) to assess whether soils are stable enough for partial funding eligibility.

Step 8: Complete Form HBG-SOIL-001-FS. If Track 1 eligible, sign and submit to program administrator. If proceeding to Track 2, complete the Track 2 checklist and written stability narrative on the field sheet. Sign and submit to program administrator. Track 2 determinations require a written narrative referencing USCS classification, field observations, and basis for stability finding.

5.3 Decision Points

Mapped series vs. field conditions: If observed field conditions deviate significantly from the mapped series (e.g., fill material, severely disturbed profile, graded cut introducing different parent material), the evaluator must document the deviation. Use observed field conditions — not mapped series alone — as the basis for USCS classification and suitability determination.

Multiple soil types in corridor: If the road or trail corridor crosses multiple map units or soil types, evaluate each. Use the most limiting USCS classification as the controlling determination for the overall project.

Engineering handoff trigger: If soil evaluation identifies Provisional or Not Suitable soils, or if surface treatment or stream crossing work is indicated, flag the project for engineering referral before grant funds are released for construction. Soil scientist does not determine the engineering solution. Track determination: Track 1 is evaluated first on every project using the checklist in Section 8. If all Track 1 criteria are confirmed, the project is Track 1 eligible (full funding) and Section 9 is not completed. If any Track 1 criterion is not met, the evaluator proceeds to Track 2 (Section 9) to determine whether soils are stable enough for partial funding eligibility. A project cannot be evaluated for Track 2 without first completing Track 1.

6. USCS Soil Suitability Reference

Use the table below to classify evaluated soils as Suitable, Provisional, or Not Suitable for road and trail use. Classification is based on USCS group symbol, drainage class, and bearing characteristics. Where field-observed conditions differ from WSS data, field conditions govern.

SUITABLE — Adequate bearing capacity; road/trail use appropriate without special soil treatment

Soil Group	USCS Symbols	Typical Drainage	Suitability	Notes
Gravels — clean	GW, GP	Well to excessive	SUITABLE	Best bearing; low rutting risk; no geotextile needed
Gravels — with fines	GM, GC	Well to mod. well	SUITABLE	Good bearing; confirm fines content not excessive
Sands — clean	SW, SP	Well to excessive	SUITABLE	Good bearing when confined; may need surfacing on steep grades

PROVISIONAL — Marginal bearing capacity; road/trail use may be appropriate with surface treatment or geotextile

Soil Group	USCS Symbols	Typical Drainage	Suitability	Notes
Silty / clayey sands	SM, SC	Mod. well to poor	PROVISIONAL	Adequate when dry; rutting risk when wet; geotextile typically required
Low-plasticity silts	ML	Poor to mod. well	PROVISIONAL	Frost-susceptible; highly erodible; geotextile required; flag for engineering
Low-plasticity clays	CL	Poor to mod. well	PROVISIONAL	Seasonal bearing loss; geotextile required; flag for engineering review

NOT SUITABLE — Poor bearing capacity; high instability or rutting risk; avoid road/trail siting

Soil Group	USCS Symbols	Typical Drainage	Suitability	Notes
High-plasticity silts	MH	Poor	NOT SUITABLE	Very low bearing; high shrink-swell; significant engineering required if unavoidable
High-plasticity clays	CH	Poor to very poor	NOT SUITABLE	Very low bearing; extreme rutting risk; avoid siting; wetland consideration
Organic silts / clays	OL, OH	Very poor	NOT SUITABLE	Very low bearing; compressible; wetland indicator; avoid siting entirely
Peat / highly organic	PT	Very poor	NOT SUITABLE	No bearing capacity; hydric soil / wetland; do not site road or trail

> *Note: For Provisional soils, the soil scientist's role is to document the classification and flag the need for surface treatment or geotextile. Specification of treatment type, thickness, and materials is an engineering function outside this SOP.*

7. NRCS Practice Standards — Soil Criteria Reference

The following summarizes soil-specific criteria from each applicable NRCS practice standard. Engineering criteria (road geometry, drainage structure design, culvert sizing) are not included here.

CPS 560 — Access Road (Soil Criteria)

Criterion	Soil-Specific Requirement
Soil Investigation	A soils investigation with boring locations and USCS classification must be on file for Track 1 projects. For existing roads, field evaluation with documented USCS classification satisfies this requirement.
Bearing Capacity	Soils with weak bearing capacity (silts, organics, clays — Provisional or Not Suitable USCS groups) require geotextile under any surface treatment. Suitable soils may not require surface treatment at all.
Slide-Prone Soils	Avoid siting roads on soils subject to slides. Where unavoidable, flag for engineering treatment. Evaluator documents soil conditions; engineer specifies stabilization.
Cut & Fill Slopes	Slopes must be designed to maintain stability. Minimum 2:1 (H:V). Steeper slopes only where rock or soil conditions warrant and with engineering stabilization. Soil scientist documents observed slope soil conditions.
Shoulder Protection	Shoulders and disturbed areas must be vegetated or otherwise protected. Soil scientist notes current vegetative cover and erosion evidence.

CPS 561 — Heavy Use Area Protection (Soil Criteria)

Criterion	Soil-Specific Requirement
Subbase Soil Suitability	Subbase material must be free of vegetation, organic matter, and highly plastic soils. Existing subbase assessed for USCS classification. Provisional or Not Suitable subbase soils trigger geotextile requirement.
Geotextile Requirement	Geotextile required when native soils are Provisional or Not Suitable per USCS, or when it is necessary to separate surface material from subbase. Soil scientist identifies where geotextile is indicated; engineer specifies type and installation.
Surface Material Suitability	Surfacing material must be non-toxic and non-acid-forming. Soil scientist confirms no toxic or acid-forming native materials are present in the road corridor.

CPS 578 — Stream Crossing (Soil Criteria)

Criterion	Soil-Specific Requirement
Approach Soil Suitability	Crossing approaches must be constructed of material able to withstand repeated use. Soil scientist evaluates approach soils for USCS classification and notes Provisional or Not Suitable conditions requiring treatment.
Backfill Suitability	Backfill material must be suitable — free of organics and high-plasticity soils. Soil scientist evaluates and documents native soil USCS classification at crossing locations.
Scour Potential	Soils adjacent to and beneath crossings must be assessed for scour susceptibility. Erodible soils (fine sands, silts) at crossing locations are flagged for engineering review.
Setbacks	Stream crossing approaches must be set back and managed to protect bank stability. Soil scientist notes soil erodibility and bank composition at crossing sites.

CPS 655 — Forest Trails and Landings (Soil Criteria)

Criterion	Soil-Specific Requirement
Soil Bearing Suitability	Trails must avoid poorly suited soils of low bearing strength. For existing trails, soil scientist evaluates USCS classification and documents whether soils are Suitable, Provisional, or Not Suitable for the observed traffic type and frequency.
Rutting & Compaction	Trail soils must not exhibit chronic rutting, displacement, or compaction inconsistent with the intended use. Active rutting on Provisional or Not Suitable soils is documented and flagged.
Wetland / Riparian Avoidance	Trails must not be sited on wetlands or riparian areas. Soil scientist notes presence of hydric soil indicators, drainage class, and proximity to watercourses.

8. Track 1 Soil Evaluation Checklist — NRCS Standard Verification

Complete this checklist on every project. Track 1 is evaluated first. If all items are confirmed, the project is Track 1 eligible and Track 2 is not required. If any item is not met, proceed to Section 9. Engineering criteria are excluded from this checklist.

✓	Track 1 Soil Criterion
☐	Web Soil Survey pulled — map unit, soil series, and drainage class documented for all relevant map units in project corridor
☐	Field site visit completed — observed soil texture, structure, color, and drainage indicators consistent with mapped series (deviations noted)
☐	USCS classification determined from field evaluation for each soil type present in road/trail corridor
☐	USCS classification is Suitable for all soils in corridor — OR — Provisional soils are present and geotextile need has been flagged for engineering referral
☐	No Not Suitable USCS soils present in road/trail corridor (CH, MH, OL, OH, PT) — OR — conditions documented and engineering referral completed
☐	Soil drainage class is moderately well drained or better — OR — drainage limitation documented and geotextile/treatment need flagged
☐	No hydric soil indicators or wetland conditions observed in road/trail footprint
☐	Subbase soils (CPS 561): evaluated for USCS classification; Provisional or Not Suitable subbase soils flagged for geotextile requirement
☐	Surface material confirmed non-toxic and non-acid-forming (no mine spoil, slag, or other reactive materials in road base)
☐	Cut and fill slope soils observed — no evidence of active slumping, sliding, or instability; soil conditions documented
☐	Shoulder and disturbed area soils: vegetative cover present and adequate to limit erosion, OR bare soil conditions documented
☐	Stream crossings present (if applicable): approach and backfill soils evaluated for USCS classification; scour-susceptible soils flagged
☐	No chronic rutting observed inconsistent with USCS classification and intended use
☐	Soils investigation documentation complete: field notes, WSS export, USCS classification on file

Project / Parcel ID: _____ Road/Trail Description: _____

WSS Map Unit(s) / Soil Series: _____ Drainage Class: _____

USCS Classification(s): _____ Overall Suitability: □ Suitable □ Provisional □ Not Suitable

Evaluator Name / Title: _____ Date: _____

Signature: _____

Notes / Deviations / Engineering Referral Flags:

_____

_____

9. Track 2 Soil Evaluation Checklist — Professional Stability Determination

Complete this checklist only if one or more Track 1 criteria (Section 8) were not met. Track 2 determines whether soils are stable and non-limiting enough to support partial funding eligibility despite not meeting full NRCS standards. All indicators must be addressed. A written narrative determination with signature is required. Projects with Not Suitable USCS soils (CH, MH, OL, OH, PT) in the road/trail footprint are not eligible under Track 2.

✓	Track 2 Soil Stability Indicator
□	Web Soil Survey reviewed — map unit, soil series, drainage class, and road suitability interpretation documented
□	Field site visit completed by Division Soil Scientist — date and evaluator name recorded
□	USCS classification determined for all soil types observed in road/trail corridor and documented
□	Soils are Provisional USCS at most limiting point — Not Suitable soils (CH, MH, OL, OH, PT) are not present in road/trail footprint
□	No active rutting observed — road/trail surface maintaining integrity under current traffic type and frequency
□	No active erosion, rilling, or surface displacement observed on road surface or adjacent disturbed soils
□	Soil drainage class documented — no ponding, seepage, or saturated conditions observed at or near road surface during evaluation
□	Cut and fill slope soils stable — no evidence of slumping, sliding, piping, or undercutting observed
□	Stream crossing approach and backfill soils (if present) are non-erodible and free of high-plasticity or organic material
□	No hydric soil indicators in road/trail footprint (no F-horizon, no depleted matrix, no aquic conditions at surface)
□	Vegetative cover on shoulders and disturbed areas adequate to limit erosion given soil erodibility
□	Written soil stability determination narrative completed with professional signature

Project / Parcel ID: _____ Road/Trail Description: _____

WSS Map Unit(s) / Soil Series: _____ Drainage Class: _____

USCS Classification(s): _____ Most Limiting Classification: _____

Soil Scientist Name / Title: _____ Date: _____

Signature: _____

Basis for Soil Stability Determination (required — reference soil series, USCS classification, field observations, and rationale for stability finding; attach additional pages as needed):

_____

_____

_____

_____

_____

10. Health & Safety Considerations

- Wear appropriate PPE during field evaluation; high-visibility vest required when working adjacent to active roads
- Assess slope stability visually before approaching cut-face or fill slopes — do not evaluate actively slumping areas
- Follow NCDA heat and weather safety protocols for field work
- Notify supervisor of field evaluation schedule and site location prior to departure

11. Forms, Tools & References

Software / Systems:

- Web Soil Survey — websoilsurvey.usda.gov
- NRCS eFOTG (Electronic Field Office Technical Guide) — NC state-specific CPS versions

Policies & Standards:

- NRCS CPS Access Road (Code 560) — September 2020
- NRCS CPS Heavy Use Area Protection (Code 561)
- NRCS CPS Stream Crossing (Code 578)
- NRCS CPS Forest Trails and Landings (Code 655) — October 2017
- NC state-adopted versions of each CPS (supersede national where applicable)
- Helene Block Grant Road Repair Program Guidelines
- Form HBG-SOIL-001-FS

12. Records & Documentation

Records Created:

- Completed Form HBG-SOIL-001-FS
- Engineering referral documentation where Provisional or Not Suitable soils were identified

Storage Location:

- Project file maintained by Block Grant Program Administrator
- Copy retained by Division Soil Scientist

13. Training & Communication

- All evaluators must be familiar with NRCS CPS 560, 561, 578, and 655 soil criteria and the USCS classification system prior to conducting evaluations
- Evaluators must be able to use Web Soil Survey to pull area-of-interest data and interpret road suitability interpretations
- New evaluators should complete at least one joint field evaluation with an experienced soil scientist before working independently
- SOP updates communicated to applicable staff by Division Soil Scientist and posted to shared program files

14. Revision History

Version	Date	Description of Change	Author / Approved By
1.0	2026	Initial version — Helene Block Grant Road Repair Program	[Dalton Buchanan]
2.1	2026	Modified formatting to include page numbers	[Rachel Smith]