STATEMENT OF WORK

SCOPE OF CONTRACT

Provide all equipment, labor, materials, tools, and other incidentals and execute all work necessary to perform the required culvert replacement and road maintenance on the designated National Forest roads in accordance with the specifications, and bidder's technical proposal which is incorporated by reference. The work consists of installing erosion and sedimentation controls (E&S Controls), removing a 42" x 50" x 45' corrugated metal pipe arch (CPMA), replacing it with a 128" x 83" x 44' CPMA designed for aquatic organism passage (AOP), reconstructing a 600' section of roadway, and placing and compacting driving surface aggregate on the reconstructed road surface. All work performed will be completed in accordance with the Standard Specification for Roads and Bridge on Federal Highway Projects FP-14 and the Forest Service Supplemental Specifications to the FP-14 (FSSS) included as part of this contract.

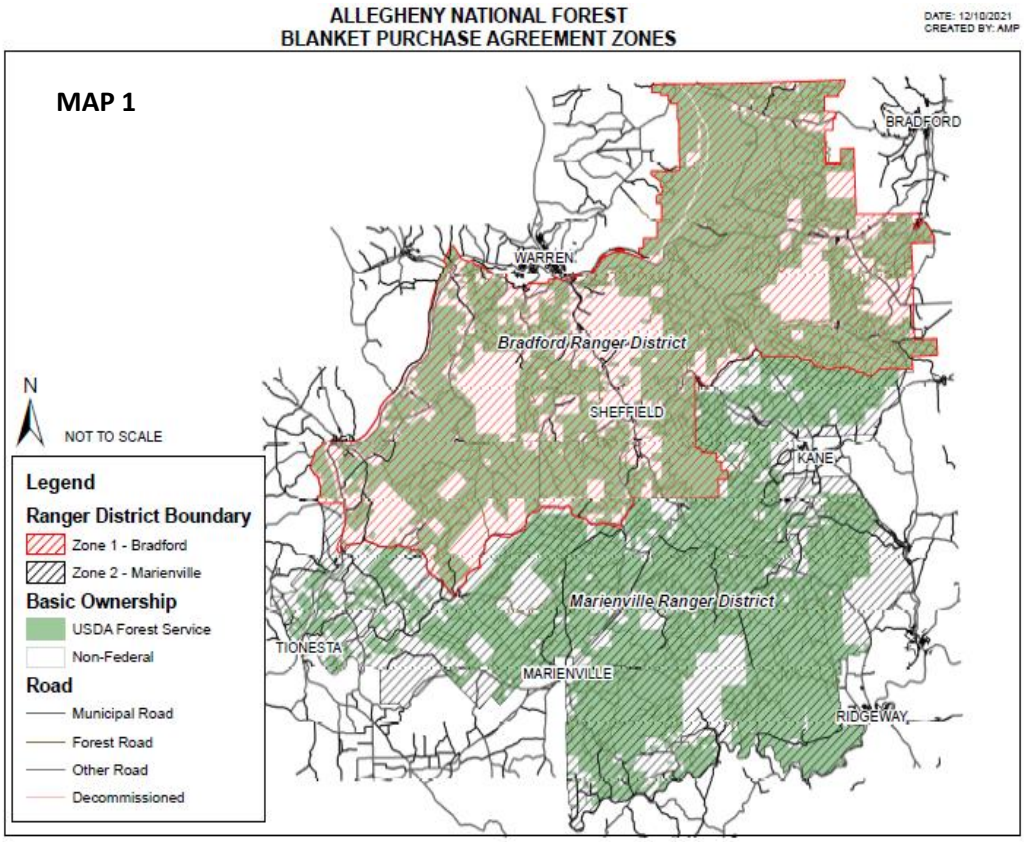
LOCATION AND DESCRIPTION OF WORK

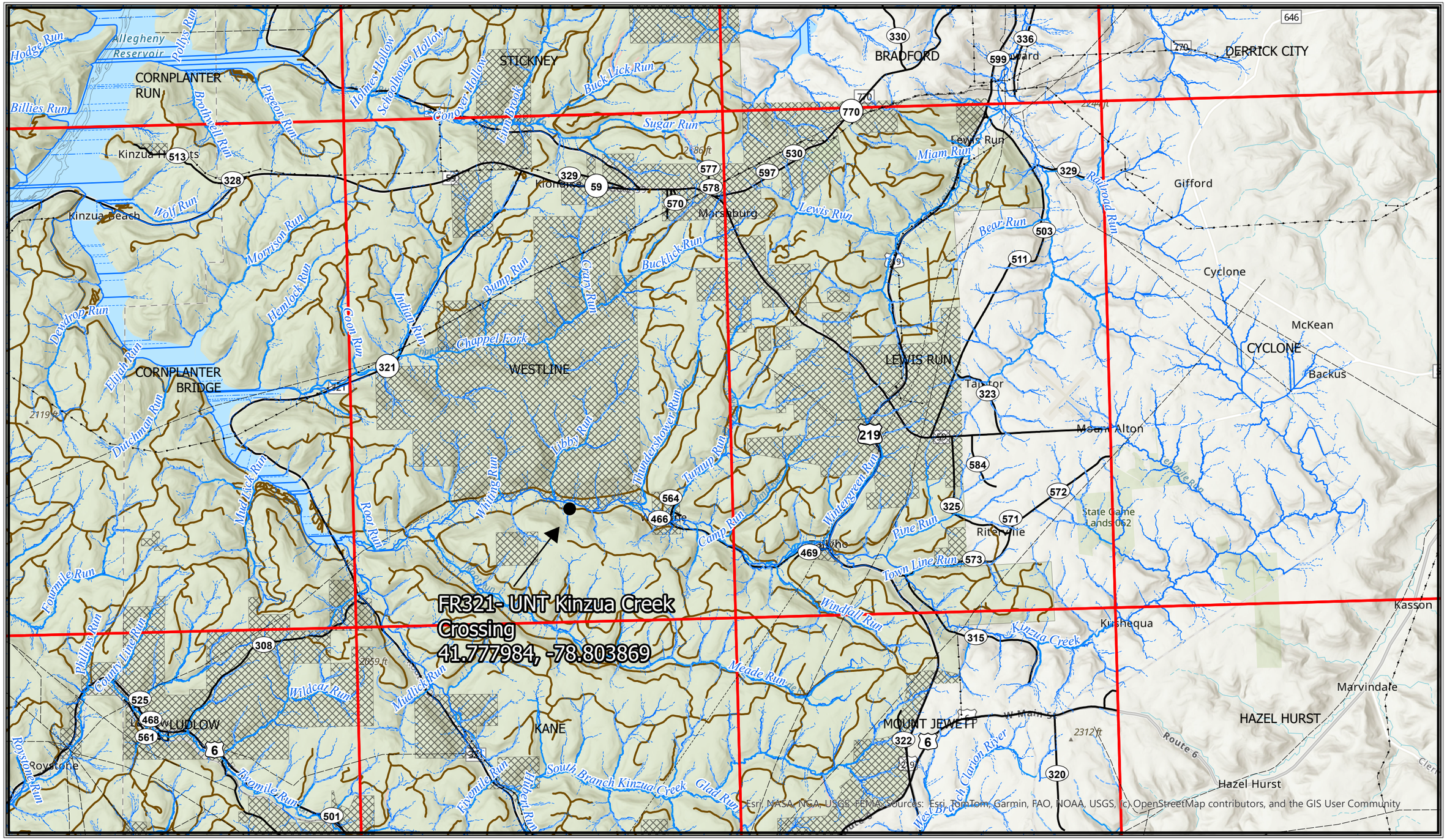
The specified Work Site is located in Hamilton Township, McKean County, within the Zone 1, Bradford Ranger District (Map 1), of the Allegheny National Forest. The Work Site is located 300' on either side of where Forest Road 321 crosses an Unnamed Tributary to Kinzua Creek (UNT Kinzua Creek) at 41.777984, -79.803869 (Map 2). Materials to be delivered include items specified on Table 1 and the length of road that will receive maintenance is a total of 600' (~0.11 miles).

The recommended sequence of construction is as follows:

1. Complete work in low flow conditions and install 12" compost filter sock downstream of the earth disturbance areas before any excavation begins, as shown on plan drawings. Install bypass pump system and sediment laden water pumping system, including a sediment filter bag. Refer to Temporary Bypass detail. If existing natural pool shown on plan drawings is insufficient for pump around use, construct sandbag coffer dam to raise its elevation as needed for pump around use. This pool is located upstream of the proposed excavation area and away from any earth disturbance. Refer to Sandbag Headwall/coffer dam detail. Begin pumping the water around the proposed work area.
2. Remove existing culvert and excavate trench to accommodate the new structure. All material excavated during the culvert removal shall be stockpiled away from areas affected by flood waters or wetlands and stabilized within 24 hours.
3. Install new culvert. Refer to the Culvert Section for installation instructions. Embed culvert to specified elevations.
4. Backfill and compact fill material around the new culvert.
5. Fill roadway side slopes to a finished grade of 2H: 1V or less to the top of the culvert and match existing grade below the top of the culvert.
6. Install grade controls as shown on the drawings, as well as streambed fill material. Install bank armoring rock.
7. Remove bypass pumping system and (if installed) sand bag headwall/coffer dam, and incorporate rock energy dissipator as grade control structure in stream.

8. Reconstruct 300’ of road on either side of the culvert. Place and compact limestone driving surface aggregate.
9. Remove waste material stockpile and stabilize area with seed and mulch.
10. Permanently seed and mulch all disturbed areas outside of the roadway.
11. Haul the removed pipe and dispose of at a DEP approved waste site.





USDA

Map 2 - Forest Road 321- UNT to Kinzua Creek AOP Replacement

Allegheny National Forest - Bradford Ranger District

1:100,000

NAD 1983 UTM 17N

0 3 6 Miles

Project: T:\FS\NFS\Allegheny\Program\6800InformationMgmt\GIS\Workspace\MOdonish\AOPs\FR321\FR321 AOP\FR321 AOP.aprx

The USDA Forest Service makes no warranty, expressed or implied regarding the data displayed on this map, and reserves the right to correct, update, modify, or replace this information without notification.

Legend

- Powerline
- Telephone
- Pipeline
- Quadrangle Boundary R9 ANF
- Perennial
- Intermittent
- Perennial
- Intermittent
- Ephemeral
- Municipal Road
- Forest Road
- Other Road
- Decommissioned
- Forest Service Ownership
- Non-FS Ownership

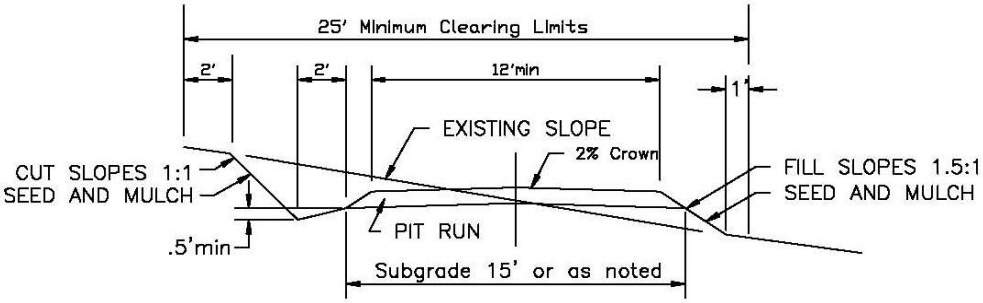
N W E S

Map Author: modonish;
Map Creation Date: 2/12/2026

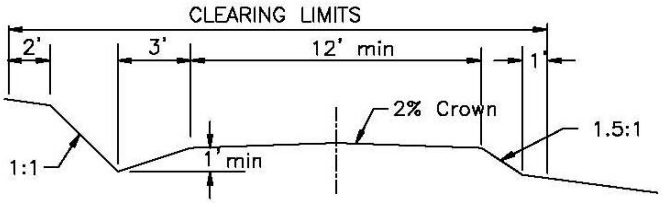
GENERAL NOTES:

1. A pre-work conference will be conducted after the contract award.
2. Prior to any earth disturbing activities, contractor shall call the Pennsylvania One Call System (800-242-1776) and all Oil & Gas Operators in the work area to determine locations of any underground utility lines.
3. Contractor shall install “ROAD CLOSED,” “TRUCK TRAFFIC” or “ROAD CONSTRUCTION AHEAD” signs on all roads worked on in this project. Signs shall conform to the Manual on Uniform Traffic Control Devices (MUTCD). Contractors sign plan must be approved by Forest Service prior to work. Signs will be covered on weekends, holidays, and any days when contractor is not working.
4. The Contractor is authorized to use roads under the jurisdiction of the Forest Service for all activities necessary to complete this contract, subject to the limitations and authorizations designated in the Road Order(s) or described in the contract, when such use will not damage the roads or national forest resources, and when traffic can be accommodated safely.
5. Work hours will be during daylight hours, Monday thru Friday. No evening work or work on weekends or Federal holidays will be allowed without approval of the Contracting Officer's Representative.
6. The contractor shall be held liable and is responsible for any damage caused by their personnel or equipment to any pipelines, trees, culverts, signs, posts, riprap, or structures. Repair or replacement shall be at the Contractor's expense and at no additional cost to the Government. Ordered repair of culvert inlet or outlet shall be by field methods such as, jacking out or cutting away damaged metal which obstructs flow, or replacing a section if beyond repair. All cut edges and damage to galvanized coating shall be cleaned and treated with zinc-rich coating. In addition, any damage done to underground or over-ground pipelines or utilities owned by oil and gas operators will be repaired at the contractor’s expense. Wounds on trees caused by grading will be treated with a commercial tree dressing.
7. Within 10 days after the contract award, the contractor will submit to the Contracting Officer and Contracting Officer Representative for approval, a plan of operation indicating the proposed timetable to complete the scheduled work activities. Contractor shall notify the COR of any changes to the plan of operation by phone call or e-mail.
8. Contractor is responsible to have in place a quality control system that will ensure work is performed in an acceptable manner. Contractor will promptly furnish the COR with all the POCS Serial number, weight tickets, and material certifications as required by the COR.
9. DSA limestone shall be shipped at optimum moisture content not exceeding 15%. Limestone loads that fail field test parameters will be rejected. Refer to 703.18 for DSA placement.
10. Roads shall be completed in such a manner that water shall not pond on roadbed or in ditch lines.
11. Contouring, topsoil re-spreading, seeding, and mulching of disturbed areas as determined by the Forest Service is required.
12. Roadway sod encountered during road reconditioning operations will be spread and leveled outside the road template avoiding piles. Natural terrain depressions and openings are the preferred waste locations. Seeding and mulching may be required to supplement natural revegetation.
13. Contractor shall install compostable filter sock at live stream crossings to eliminate sediment in the stream course. Any sediment collected will be removed and stabilized with seed and mulch. This will be considered incidental to Pay Item 60
14. Design drawings for “FR 321 CULVERT REPLACEMENT” are provided in a separate Adobe Acrobat document as “FR321 x UNT Kinzua Creek Construction Plans”.
15. All permits for applicable in-stream work will be obtained by the US Forest Service.

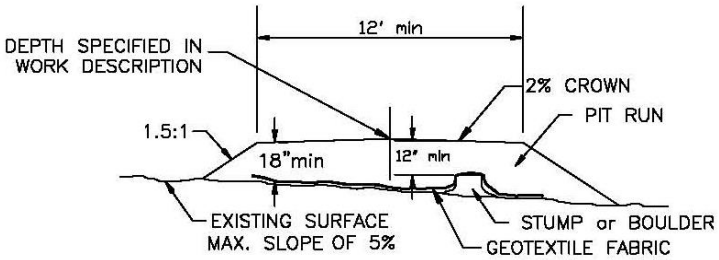
Roadbed Details & Drawings



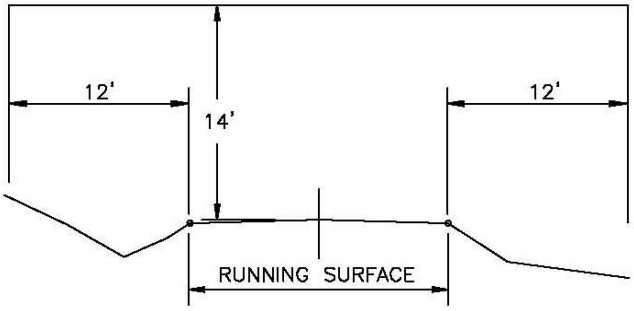
TYPICAL CONSTRUCTION SECTION



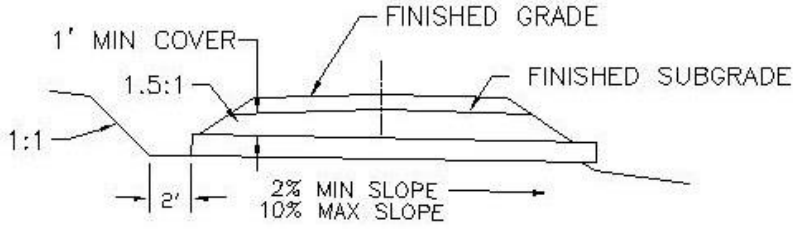
TYPICAL RECONDITION SECTION



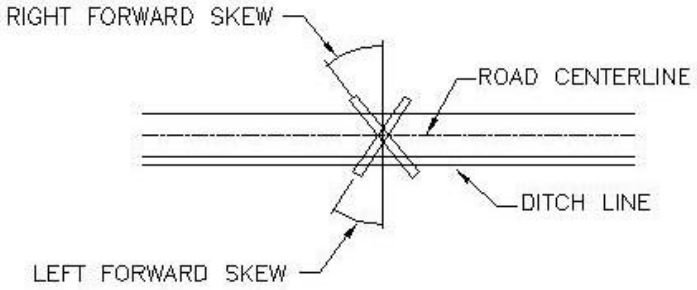
TYPICAL FABRIC SECTION W/O TEMPLATE



ROADSIDE BRUSHING DETAIL

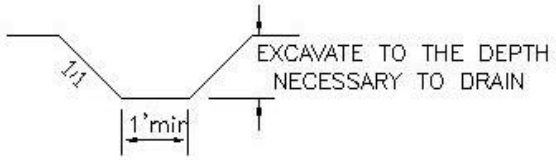


CULVERT SECTION

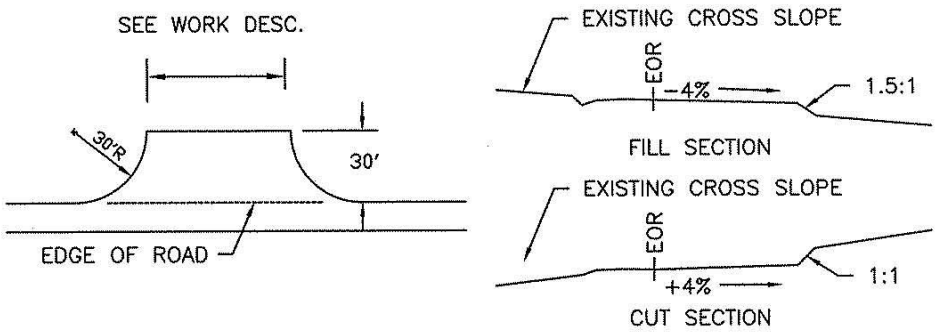


SKEW DETAIL

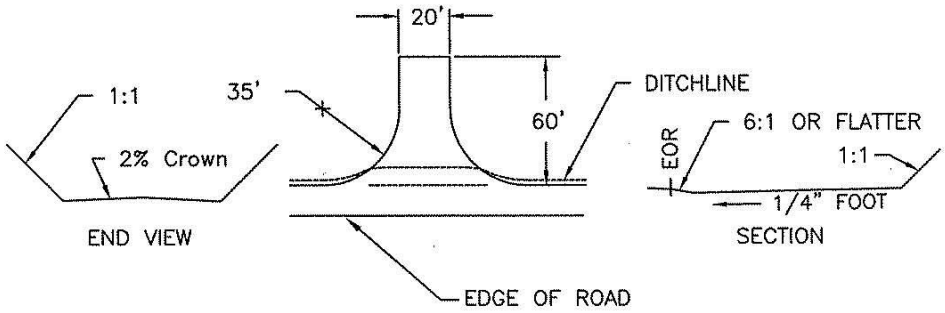
NOTE: Field locate ditch to minimize new clearing



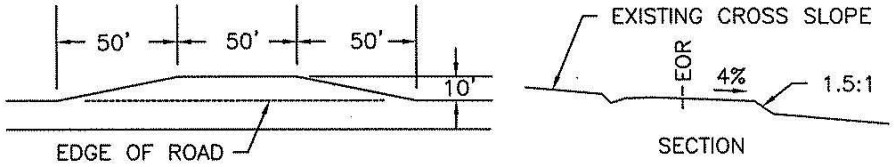
OUTLET/LEAD OFF DITCH SECTION



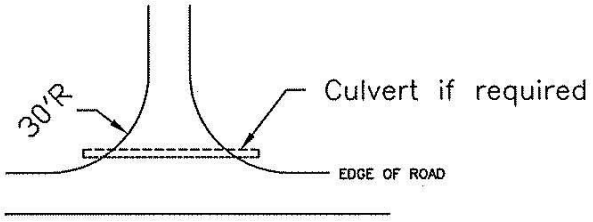
PARKING LOT DETAIL



TURNAROUND DETAIL



TURNOUT DETAIL



INTERSECTION DETAIL

Allegheny National Forest

FP-14 Forest Service Supplement Specifications

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Specifications Description

The following specifications will be used for this contract:

Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects – FP-14 U.S. Customary Units. FP-14 is available on the internet at the following site: http://flh.fhwa.dot.gov/resources/pse/specs/

Supplemental Specifications – The specifications identified in this contract were prepared by the Forest Service and are a supplement to or change the FHWA specifications.

Special Project Specifications – Are specifications prepared on the Allegheny National Forest and pertain to Pennsylvania Department of Transportation nomenclature. These are designated SPS.

Preface

Preface_National_12_28_2017

Delete all but the first paragraph and add the following:

The Forest Service, US Department of Agriculture has adopted FP-14 for construction of National Forest System Roads.

101 - Terms¸ Format¸ and Definitions

101.01_National_3_15_2017

Add the following paragraph to Subsection 101.01:

101.01 Meaning of Terms.
Delete all references to the TAR (Transportation Acquisition Regulations) in the specifications.

101.03_National_11_9_2016

Add the following to Subsection 101.03:

101.03 Abbreviations.
(a) Acronyms.

AGAR — Agriculture Acquisition Regulations

AFPA — American Forest and Paper Association

FSAR — Forest Service Acquisition Regulations

MSHA — Mine Safety and Health Administration

NESC — National Electrical Safety Code

NIST — National Institute of Standards and Technology

WCLIB — West Coast Lumber Inspection Bureau

(f) Miscellaneous unit abbreviations.

MP	—	milepost	location
ppm	—	parts per million	volume
STA		station	location

101.04_National_11_9_2016

Make the following changes to Subsection 101.04:

101.04 Definitions.

Delete these definitions and replace the following:

Bid Schedule — The Schedule of Items.

Bridge — A structure, including supports, erected over a depression or an obstruction such as water along a road, a trail, or a railway and having a deck for carrying traffic or other loads.

Contractor — The individual or legal entity contracting with the Government for performance of prescribed work. In a timber sale contract, the contractor is the "Purchaser".

Culvert — Any structure with a bottom, regardless of fill depth, depth of invert burial, or presence of horizontal driving surface, or any bottomless (natural channel) structure with footings that will not have wheel loads in direct contact with the top of the structure.

Drawings — (Public Works Contracts) Design sheets or fabrication, erection, or construction details submitted to the CO by the Contractor according to FAR Clause 52.236-21 Specifications and Drawings for Construction. Also refers to submissions and submittals.

Notice to Proceed — (Public Works Contracts) Written notice to the Contractor to begin the contract work.

Right-of-Way — A general term denoting (1) the privilege to pass over land in some particular line (including easement, lease, permit, or license to occupy, use, or traverse public or private lands), or (2) Real property necessary for the project, including roadway, buffer areas, access, and drainage areas.

Solicitation—(Public Works Contracts) The complete assembly of documents (whether attached or incorporated by reference) furnished to prospective bidders.

Add the following definitions:

Adjustment in Contract Price — "Equitable adjustment," as used in the Federal Acquisition Regulations, or "construction cost adjustment," as used in the Timber Sale Contract, as applicable.

Change — "Change" means "change order" as used in the Federal Acquisition Regulations, or "design change" as used in the Timber Sale Contract.

Forest Service — The United States of America, acting through the Forest Service, U.S. Department of Agriculture.

Neat Line — A line defining the proposed or specified limits of an excavation or structure.

Pioneer Road — Temporary construction access built along the route of the project.

Purchaser — The individual, partnership, joint venture, or corporation contracting with the Government under the terms of a Timber Sale Contract and acting independently or through agents, employees, or subcontractors.

Protected Streamcourse — A drainage shown on the plans or timber sale area map that requires designated mitigation measures.

Road Order — An order affecting and controlling traffic on roads under Forest Service jurisdiction. Road Orders are issued by a designated Forest Officer under the authorities of 36 CFR, part 260.

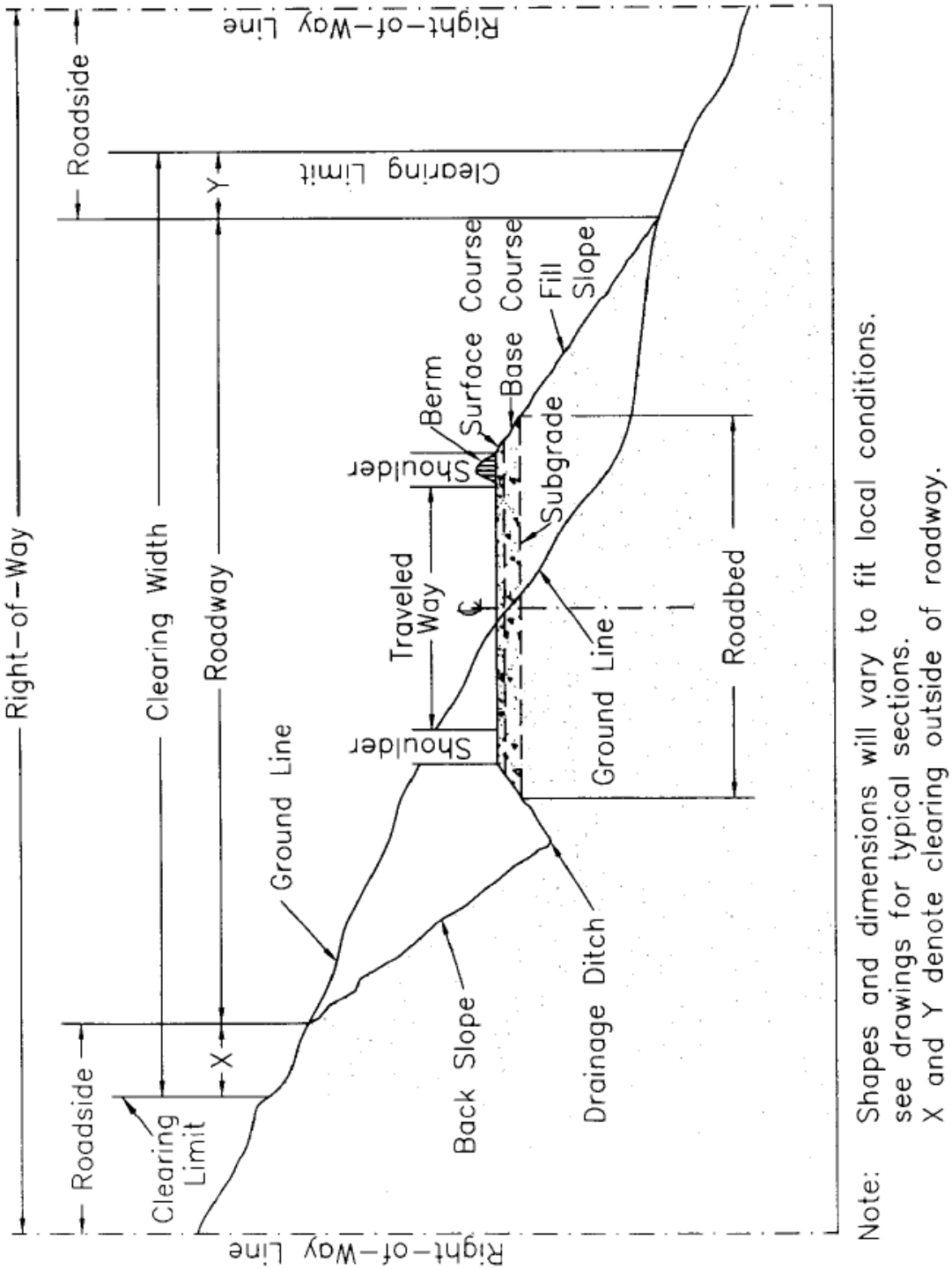
Shop Drawings — (Timber and Stewardship Contracts) Referred to as "Drawings" in FP-14, include drawings, diagrams, layouts, schematics, descriptive literature, illustrations, lists or tables, performance and test data, and similar materials furnished by Purchaser to explain in detail specific portions of the work required by the contract.

Schedule of Items — A schedule in the contract that contains a listing and description of construction items, quantities, units of measure, unit price, and amount.

Utilization Standards — The minimum size and percent soundness of trees described in the specifications to determine merchantable timber.

Add Figure 101-1—Illustration of road structure terms:

Figure 101-1—Illustration of road structure terms.



102 - Bid¸ Award¸ and Execution of Contract

102.00_National_11_9_2016

Delete Section 102 in its entirety.

Delete Section 102.

103 - Scope of Work

103.00_National_11_9_2016

Delete all of Section 103 except Subsection 103.01 Intent of Contract.

Delete Subsections 103.02, 103.03, 103.04, 103.05.

104 - Control of Work

104.00_National_11_9_2016

Delete Subsections 104.01, 104.02, and 104.04.

Delete Subsections 104.01, 104.02, 104.04.

104.03_National_11_4_2016

Add the following to Subsection 104.06:

104.06 Use of Roads by Contractor.

The Contractor is authorized to use roads under the jurisdiction of the Forest Service for all activities necessary to complete this contract, subject to the limitations and authorizations designated in the Road Order(s) or described in the contract, when such use will not damage the roads or national forest resources, and when traffic can be accommodated safely.

106 - Acceptance of Work

106.01_National_7_18_2017

Delete Subsection 106.01 and replace with the following:

106.01 Conformity with Contract Requirements.

Follow the requirements of FAR Clause 52.246-12 Inspection of Construction.

References to standard test methods of AASHTO, ASTM, GSA, and other recognized standard authorities refer to the methods in effect on the date of solicitation for bids.

Perform all work to the lines, grades, cross-sections, dimensions, and processes or material requirements shown on the plans or specified in the contract.

Incorporate manufactured materials into the work according to the manufacturer's recommendations or to these specifications, whichever is stricter.

Plan dimensions and contract specification values are the values to be strived for and complied with as the design values from which any deviations are allowed. Perform work and provide material that is uniform in character and reasonably close to the prescribed value or within the specified tolerance range. The purpose of a tolerance range is to accommodate occasional minor variations from the median zone that are unavoidable for practical reasons.

When standard manufactured items are specified (such as fence, wire, plates, rolled shapes, pipe conduits, etc., that are identified by gauge, unit mass, section dimensions, etc.), the identification will be considered to be nominal masses or dimensions. Unless specific contract tolerances are noted, established manufacturing tolerances will be accepted.

The Government may inspect, sample, or test all work at any time before final acceptance of the project. When the Government tests work, copies of test reports are furnished to the Contractor upon request. Government tests may or may not be performed at the work site. If Contractor testing and inspection is verified by the Government, the Contractor's results may be used by the Government to evaluate work for acceptance. Do not rely on the availability of Government test results for process control.

Acceptable work conforming to the contract will be paid for at the contract unit bid price. Four methods of determining conformity and accepting work are described in Subsections 106.02 to 106.05 inclusive. The primary method of acceptance is specified in each Section of work. However, work may be rejected at any time it is found by any of the methods not to comply with the contract.

Remove, repair, or replace work that does not conform to the contract, or to prevailing industry standards where no specific contract requirements are noted. Removing, repairing, or replacing work; providing temporary traffic control; and any other related work to accomplish conformity will be at no cost to the Government.

(a) Disputing Government test results. If the accuracy of Government test results is disputed, promptly inform the CO. If the dispute is unresolved after reasonable steps are taken to resolve the dispute, further evaluation may be obtained by written request. Include a narrative describing the dispute and a proposed resolution protocol that addresses the following:

1. Sampling method;
2. Number of samples;
3. Sample transport;
4. Test procedures;
5. Testing laboratories;
6. Reporting;
7. Estimated time and costs; and
8. Validation process.

If the evaluation requires additional sampling or testing be performed, mutually agree with the Government on witnessing procedures and on sampling and testing by a third party laboratory. Use a third party laboratory accredited by the AASHTO accreditation program. Provide proof of the laboratory's accreditation for the test procedures to be used. Do not use the same laboratory that produced the disputed Government test results or that produced the test results used as a basis for the dispute.

The CO will review the proposed resolution protocol and may modify it before final approval and execution.

The Government will use the approved resolution protocol test results to determine the validity of the disputed testing. If the Government test results are validated, the Contractor will be responsible for all costs associated with developing and performing the resolution protocol. If the Government test results are not validated, the Government will be responsible for all costs associated with developing and performing the resolution protocol. If the validity of the Government test results cannot be determined, the Contractor and Government will equally share all costs associated with developing and carrying out the resolution protocol.

(b) Alternatives to removing and replacing non-conforming work. As an alternative to removal and replacement, the Contractor may submit a written request to:

1. Have the work accepted at a reduced price; or
2. Be given permission to perform corrective measures to bring the work into conformity.

The request must contain supporting rationale and documentation. Include references or data justifying the proposal based on an evaluation of test results, effect on service life, value of material or work, quality, aesthetics, and other tangible engineering basis. The CO will determine disposition of the nonconforming work.

106.02_National_11_9_2016

Delete Subsection 106.02 and replace with the following:

106.02 Visual Inspection.

Acceptance is based on visual inspection of the work for compliance with the specific contract requirements. Use prevailing industry standards in the absence of specific contract requirements or tolerances.

106.07_National_11_1_2016

107 - Legal Relations and Responsibility to the Public

Delete Subsection 107.05.

107.05 Responsibility for Damage Claims.

Add the following to Subsection 107.10:

107.10 Environmental Protection.

(e) Design and locate equipment repair shops, stationary refueling sites, or other facilities to minimize the potential and impacts of hazardous material spills on Government land.

Before beginning any work, submit a Hazardous Spill Plan. List actions to be taken in the event of a spill. Incorporate preventive measures to be taken, such as the location of mobile refueling facilities, storage and handling of hazardous materials, and similar information. Immediately notify the CO of all hazardous material spills. Provide a written narrative report form no later than 24 hours after the initial report and include the following:

- Description of the item spilled (including identity, quantity, manifest number, and other identifying information).
- Whether amount spilled is EPA or state reportable, and if so whether it was reported, and to whom.
- Exact time and location of spill including a description of the area involved.
- Containment procedures.
- Summary of any communications the Contractor had with news media, Federal, state and local regulatory agencies and officials, or Forest Service officials.
- Description of clean-up procedures employed or to be employed at the site including final disposition and disposal location of spill residue.

When available provide copies of all spill related clean up and closure documentation and correspondence from regulatory agencies.

The Contractor is solely responsible for all spills or leaks that occur during the performance of this contract. Clean up spills or leaks to the satisfaction of the CO and in a manner that complies with Federal, state, and local laws and regulations.

108 - Prosecution and Progress

108.00_National_11_9_2016

Delete Section 108 in its entirety.

Delete Section 108.

109 - Measurement and Payment

109.02_National_11_9_2016

Add the following sentence to Subsection 109.02(b):

109.02 Measurement Terms and Definitions.

(b) Contract quantity.

Contract quantities will be adjusted only when there are errors in the original design of 15% or more.

109.00_National_11_9_2016

Delete Subsections 109.06, 109.07, 109.08, and 109.09:

109.06 Pricing and Adjustments
109.07 Eliminated Work
109.08 Progress Payments
109.09 Final Payment

109.03_National_11_1_2016

Add the following to Subsection 109.03(c):

109.03 Weighing Procedures and Devices.

(c) Project weighing system.

For aggregates weighed for payment, adjust scale weights of material to deduct the daily average moisture content in excess of 2 percentage points over optimum moisture as determined by AASHTO T 99 or the designated compaction method. If moisture determination is necessary, determine the daily average moisture content in accordance with AASHTO T 255, from not less than

three representative samples of aggregate taken at random intervals each day that aggregate is being weighed.

Manual scales may be used if approved in writing by the CO and if the method of weighing meets all other contract requirements.

151 - Mobilization

151.00_ANF_01_12_2018

Delete Section 151 in its entirety and replace with the following.

Description

151.01 This work consists of moving personnel, equipment, material, and incidentals to the project and performing all work necessary before beginning work at the project site; obtaining of permits, insurance, and bonds. This work also includes washing and treating construction equipment and vehicles necessary for equipment transport to remove seeds, plants, and plant fragments before the equipment is used on Forest Service lands, according to the requirements within.

Construction Requirements

Wash the sides, tops, and undercarriages of all construction equipment. Remove all seeds, plants, plant fragments, dirt, and debris from the construction equipment. Only equipment inspected by the Forest Service will be allowed to operate within the project area. All subsequent move-ins of equipment to the project area will be treated in the same manner as the initial move-in. This requirement does not apply to cars, pickup trucks, and other vehicles that regularly travel between the construction site and areas off the National Forest.

Equipment will be considered free of soil, seed, and other such debris when a visual inspection does not disclose such material. Disassembly of equipment, components or the need for specialized inspection tools is not required.

Notify the CO in writing at least 72 hours before moving any construction equipment onto the national forest. Notification will include an agreed upon location where the equipment will be available for inspection by the Forest Service. Inspection will be required after every cleaning.

Use methods of cleaning and locations for cleaning approved by the CO.

For work at a commercial washing facility, use an approved facility.

New infestations of noxious weeds of concern to Forest Service and identified by either Contractor or Forest Service, in the Project Area or on the haul route, will be promptly reported to the other party. Contractor and Forest Service will agree on treatment methods to reduce or stop the spread of noxious weeds when new infestations are found. A current list of noxious weeds of concern to Forest Service is available at each Forest Service office.

Measurement

151.02 Clean equipment prior to moving onto this project. The initial cleaning will not be included in the measurement for payment. Payment for cleaning will only be made if subsequent cleanings are ordered by the CO. Measurement shall be on an "each" basis, meaning one complete cleaning of all equipment required for this contract. Subsequent cleanings necessitated by the Contractor's actions but not directed by the CO will not be included in the measurement for payment.

Measure mobilization according to Subsection 109.02.

Payment

151.03 The accepted quantity, measured as provided in Subsection 109.02, will be paid at the contract price per unit of measurement for the Section 151 pay item shown in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Progress payments for mobilization lump sum will be paid as follows:

(a) If applicable, bond premiums will be reimbursed according to FAR Clause 52.232-5 Payments Under Fixed-Price Construction Contracts, after receipt of the evidence of payment.

(b) When 5 percent of the original contract amount is earned from other bid items, 50 percent of the mobilization item, or 5 percent of the original contract amount, whichever is less, will be paid.

(c) When 10 percent of the original contract amount is earned from other bid items, 100 percent of the mobilization item, or 10 percent of the original contract amount, whichever is less, will be paid.

(d) Any portion of the mobilization item in excess of 10 percent of the original contract amount will be paid after final acceptance.

Include all costs associated with the initial cleaning of equipment in the unit bid price for Mobilization. Cleaning for subsequent move-ins will not be paid for unless after a suspension ordered by the CO.

151.00_ANF_01_17_2018

Measurement

151.02 Clean equipment prior to moving onto this project. The initial cleaning will not be included in the measurement for payment. Payment for cleaning will only be made if subsequent cleanings are ordered by the CO. Measurement shall be on an "each" basis, meaning one complete cleaning of all equipment required for this contract. Subsequent cleanings necessitated by the Contractor's actions but not directed by the CO will not be included in the measurement for payment.

Measure mobilization according to Subsection 109.02.

Payment

151.03 The accepted quantity, measured as provided in Subsection 109.02, will be paid at the contract price per unit of measurement for the Section 151 pay item shown in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Progress payments for mobilization lump sum will be paid as follows:

(a) When 5 percent of the original contract amount is earned from other bid items, 50 percent of the mobilization item, or 5 percent of the original contract amount, whichever is less, will be paid.

(b) When 10 percent of the original contract amount is earned from other bid items, 100 percent of the mobilization item, or 10 percent of the original contract amount, whichever is less, will be paid.

(c) Any portion of the mobilization item in excess of 10 percent of the original contract amount will be paid after final acceptance.

Include all costs associated with the initial cleaning of equipment in the unit bid price for Mobilization. Cleaning for subsequent move-ins will not be paid for unless after a suspension ordered by the CO.

153 - Contractor Quality Control

153.02_National_11_1_2016

Delete Subsection 153.02 and replace with the following:

153.02 Qualifications.

Submit the following for approval with the quality control plan:

(a) Quality control manager (QCM). Furnish a QCM who has at least 2 years' experience in construction, inspector, quality control and material testing on construction projects of similar type and scope.

(b) Testers. Provide testers with at least one year experience in the type of sampling and testing required, and with one of the following for the type of sampling and testing performed:

(1) NICET Level II certification in highway material or equivalent state or industry certification;

(2) Certification by a regional certification program (such as Western Alliance for Quality Transportation Construction (WAQTC), Northeast Transportation Technician Certification Program (NETTCP), Southeast Task Force for Technician Training and Qualification (STFTTQ), or Multi Regional Training and Certification (M-TRAC)); or

(3) At least one year employment by an AASHTO accredited laboratory performing equivalent sampling and testing.

153.03_National_11_1_2016

Add the following paragraph to the end of Subsection 153.03(b):

153.03 Quality Control Plan.

(b) Quality Control Procedures.

Submit written proposals for approval of alternate AASHTO or State approved test methods. Alternate methods may be allowed based on documented equivalence to the specified method.

153.07_National_11_1_2016

Delete Subsection 153.07 and replace with the following:

153.07 Records and control charts.

Maintain complete testing and inspection records by pay item number and make them accessible to the CO.

153.07_ANF_03_04_2019

Add the following.

153.07. Project Submittals

At a minimum the contractor shall provide project submittals as shown on the below Submittal Log. Submittal requirements are listed in the Standard Specifications, Supplemental Specifications, and Plans.

Submittal Log				
Log No.	**Incidental to Pay Item(s)**	**Description of Submittal**	**Type of Submittal**	**Specification No. / Drawings**
1	151	Hazardous Spill Plan	Plan	FSSS 107.10
2	151	Contractor Quality Control Plan	Plan	153.02
3	156	Traffic Control Plan	Plan	FSSS 156.03
4	157	Dewatering and Soil Erosion and Sediment Control Plan	Plan	FSSS 157.03
5	208	Excavation Plan	Plan	FSSS 208.04
6	251	Riprap	Material Certification	251.07
7	324	Crushed Aggregate Gradation: Road Base and Limestone Surfacing	Material Certification	324.03
8	625	Seed Mix	Material Certification	FSSS 622.02
9	648	Streambed Simulation, Rock Weirs, & Channel Rock	Material Certification	648.03

155 - Schedules for Construction Contracts

155.00_National_11_9_2016

Delete Section 155 in its entirety.

Delete Section 155.

156 - Public Traffic

156.00_National/ANF_11_4_2016

Delete Section 156 in its entirety and replace with the following:

Section 156. – PUBLIC TRAFIC

Description

156.01 This work consists of controlling and protecting public traffic adjacent to and within the project.

Material

156.02 Conform to the MUTCD and the following Sections and Subsections:

Permanent Traffic Control	633
Traffic Signing and Marking Material	718
Concrete Barriers and Precast Guardwalls	618
Temporary plastic fence	710.11

Construction Requirements

156.03 General. Accommodate traffic according to MUTCD, approved traffic control plan and this section. Perform work in a manner that ensures safety and convenience of the public. Unless otherwise provided for in Table 156-1, keep existing roads open to all traffic during road improvement work, and maintain them in a condition that will adequately accommodate traffic. Delays may not exceed **30** minutes at any one time. Accommodate public traffic on roads adjacent to and within the project until the project is accepted according to Subsection 106.07(b).

Submit traffic control plan at least 30 days prior to intended use. Perform no work that interferes or conflicts with traffic or existing access to the roadway surface until a traffic control plan has been approved.

Post construction signs and traffic control devices in conformance with MUTCD and Forest Service EM 7100-15. All required signs will be in place and approved prior to beginning work on project.

If the Contractor agrees in writing to allow public traffic to use a new road being constructed prior to completion, it will be considered an existing road for traffic control purposes.

156.04 Temporary Traffic Control. Install and maintain temporary traffic control devices adjacent to and within the project as required by the approved traffic control plan and the MUTCD. Install and maintain traffic control devices as follows:

(a) Furnish and install traffic control devices before the start of construction operations.

(b) All detours outside of clearing limits will be approved in writing by the Contracting Officer as part of the traffic control plan.

(c) Install only those traffic control devices needed for each stage or phase.

(d) Relocate temporary traffic control devices as necessary.

(e) Remove devices that no longer apply to the existing conditions.

(f) Immediately replace any device that is lost, stolen, destroyed, or inoperative.

(g) Keep temporary traffic control devices clean.

(h) Remove all temporary traffic control devices upon contract completion or when approved.

(i) When required, use flaggers certified by the American Traffic Safety Services Association, the National Safety Council, the International Municipal Signal Association, a state agency, or other acceptable organization. Perform the work described under MUTCD Part 6. Use type III, VII, VIII, or IX retroreflective sheeting on flagger paddles. Do not use flags. Flaggers must wear high visibility safety apparel as required by MUTCD 6E.02.

156.05 Temporary Closures. Road segments may be closed as shown in Table 156-1. The maximum consecutive days of closure shall be followed by a minimum number of consecutive days open to traffic as shown. Maintain traffic control devices during closure period(s). Appropriate barricades and signs will be erected and maintained as shown in the traffic control plan or as otherwise designated.

Prior to closing roads during construction, give written notice to the Contracting Officer at least 10 days in advance.

Table 156-1
Temporary Road Closures

Road Number	From Terminus	To Terminus	Maximum Consecutive Days of Closure	Minimum Consecutive Days Open
Open Roads to Public adjacent to the project area will Not Be Closed during construction				
312	51+55 (0.976 miles)	57+55 (1.090 miles)	During construction hours: M-F 7-5:30 pm	0 – Road is managed as restricted

156.06 Acceptance. Public traffic work will be evaluated under Subsection 106.02.

Measurement and Payment

156.07 Do not measure Public Traffic for payment. Payment for contract work is provided indirectly. See Subsection 109.05.

157 - Soil Erosion and Sediment Control

157.03_ANF_02_13_2018

Construction Requirements

157.03 Qualifications.

Delete entire Subsection

157.04_ANF_02_13_2018

157.04 General

Delete Subsection 157.04 and replace with the following:

At the prework meeting, or at least 15 days prior to the start of construction, submit a written plan for review and CO approval that provides permanent and temporary erosion control measures to minimize erosion and sedimentation during and after construction, including a dewatering and rewatering plan for work in live streams. Do not begin work until the necessary controls for that particular phase of work have been implemented.

Include methods to minimize disturbance to streams and prevent runoff from the construction site entering directly into streams. The "Soil Erosion Control Plan" must address all construction activities that have the potential for stream sedimentation.

During construction, do not modify the type, size, or location of any accepted control or practice without approval. Reflect in the Erosion Control Plan special concerns and measures necessary to protect resources and government improvements. Include:

(a) The construction activities and sequence of implementation relating to specific erosion control measures.
(b) The location and type of permanent controls to be implemented during construction.
(c) The location and type of temporary controls to be implemented during construction.
(d) For work in stream channels with running water a detailed dewatering plan.
(e) For work in stream channels without flowing water describe level of ground and vegetative disturbance and measures to reduce potential sediment delivery.
(f) Description of the monitoring plan.

When erosion control measures are not functioning as intended, take corrective action to eliminate or minimize pollutants in storm water discharges from the project.

Upon completion of construction at the site, remove all temporary erosion control devices, dewatering materials and equipment from Government property.

157.09_ANF_02_13_2018

157.09 Water Crossings.

Add the following:

At any channel crossing where there is running water, dewater by rerouting water flow around the site before and during excavation and embankment operations.

157.10 Diversions.

Add the following:

Dewater as follows:

(a) Dewatering.

Excavation activities shall be in accordance with section 204.

(1) Stream Bypass Dam and Pipe or Channel. Construct a dam and bypass pipe to divert the stream water around the excavation. A channel lined with an impermeable membrane may be substituted for the bypass pipe when approved by the CO, however, a water crossing shall be constructed according to 157.08 whenever construction vehicles are crossing a live waterway.

(2) Sump Hole and Pumping. Construct a sump hole that will store enough water that over flowing does not occur. The sump hole shall be lined with an impermeable membrane. Install pump(s) as required to re-route stream around construction site or as a back-up method to collect seepage. When pumping is the primary diversion method, install a pump that has a pumping capacity greater than the flow of the stream. When failure of a pump would result in movement of sediment or turbidity beyond the working area, a back-up pump shall be readily available.

157.03_ANF_03_01_2019

157.04 General.

Delete the entire subsection and replace with the following:

Prior to the start of construction, review the permanent and temporary erosion control measures to minimize erosion and sedimentation during and after construction. Do not begin work until the necessary controls for that particular phase of work have been implemented. Do not modify the type, size, or location of any control. An alternate erosion control plan with all necessary permits may be submitted 30 days before intended use.

Incorporate all permanent erosion control features into the project at the earliest practicable time, as outlined in the approved plan.

When erosion control measures are not functioning as intended, immediately take corrective action.

The limits of earth disturbance are shown on the plan map. All construction activities must be performed within the designated disturbance limits. All erosion and sediment control practices will be inspected at least every 7 days and after rainfall events. Needed repairs will be made immediately.

CONSTRUCTION SEQUENCE:

1. Close FR 312. Stage necessary equipment and materials to begin work.

2. Install filter sock as necessary to prevent sediment from entering the stream.

3. Maintain stream flow around the existing center culvert using a coffer dam during construction. In order to pass the 2-yr flood with about a 1 foot head, the upstream coffer dam should be built to provide 1 foot of freeboard. Various methods (e.g. pump around bypass system, sandbag headwall dam) will be used by the contractor to divert the clean stream water around the disturbed areas during construction of the streambed. The project will be scheduled during low flows and instream work will be completed as quickly as possible. Suitable excavated material will be stockpiled and protected from rain away from the stream. Filter sock will be placed around stockpile. All unsuitable material will be hauled off-site.

4. The water shall be pumped to a filter bag located in a well vegetated area off the edge of the road. This shall be done prior to placement of the gravel bedding.

5. Construct stream channel, rock clusters, boulder constrictions, transitions, and cross-channel ribs following Channel Details and Typical Cross Sections and 648.10 and 648.11. Once instream construction is completed, remove dewatering pump and filter.

6. Haul the removed pipe off-site and properly dispose of it.

7. Permanently seed and mulch all disturbed areas outside of the roadway.

NOTE: Site stabilization is achieved when a minimum of 70% perennial vegetated cover is established on all disturbed areas.

9. After site stabilization is achieved, contractor is to remove temporary erosion control measures (e.g. Filter sock). Clean up and reopen FR 312.

204 - Excavation and Embankment

204.00_National_11_4_2016

Delete Section 204 in its entirety and replace with the following.

Section 204. — EXCAVATION AND EMBANKMENT

Description

204.01 This work consists of excavating material and constructing embankments. This work also includes furnishing, hauling, stockpiling, placing, disposing, sloping, shaping, compacting, and finishing earthen and rocky material.

204.02 Definitions.

(a) Excavation. Excavation consists of the following:

(1) Roadway excavation. Material excavated from within the right-of-way or easement areas, except subexcavation covered in Subsection 204.02(a)(2) and structure excavation covered in Sections 208 and 209. Roadway excavation includes all material encountered regardless of its nature or characteristics.

(2) Subexcavation. Material excavated from below subgrade elevation in cut sections or from below the original ground-line in embankment sections. Subexcavation excludes the work required by Subsection 204.05 or 204.06.

(3) Borrow excavation. Material used for embankment construction that is obtained from outside the roadway prism. Borrow excavation includes unclassified borrow, and topping.

(b) Embankment construction. Embankment construction consists of placing and compacting roadway or borrow excavation. This work includes:

(1) Preparing foundation for embankment;

(2) Constructing roadway embankments;

(3) Benching for side-hill embankments;

(4) Constructing dikes, ramps, mounds, and berms; and

(5) Backfilling subexcavated areas, holes, pits, and other depressions.

(c) Conserved topsoil. Excavated material conserved from the roadway excavation and embankment foundation areas that is suitable for growth of grass, cover crops, or native vegetation.

(d) Waste. Excess and unsuitable roadway excavation and subexcavation that cannot be used.

Material

204.03 Conform to the following Subsections:

Topping	704.05
Unclassified borrow	704.06
Water	725.01(c)

Construction Requirements

204.04 Preparation for Roadway Excavation and Embankment Construction. Clear the area of vegetation and obstructions according to Sections 201 and 203.

Road pioneering, slash disposal, and grubbing of stumps may proceed concurrently with excavation and embankment. Maintain drainage during pioneering operations.

204.05 Conserved Topsoil. When designated, conserve topsoil from roadway excavation and embankment foundation areas. Stockpile conserved topsoil in low windrows immediately beyond the rounding limits of cut and embankment slopes or in other approved locations. Separate conserved topsoil from other excavated material. When designated, place conserved topsoil on completed slopes according to Section 624.

204.06 Roadway Excavation. Excavate as follows:

(a) Rock cuts. Blast rock according to Section 205. Excavate rock cuts to 6 inches (150 millimeters) below subgrade within the roadbed limits. Backfill to subgrade with topping or other suitable material. Compact the material according to Subsection 204.11.

(b) Earth cuts. Scarify earth cuts to 6 inches (150 millimeters) below subgrade within the roadbed limits. Compact the scarified material according to Subsection 204.11.

(c) Pioneer Roads. Conduct excavation and placement operations so material to be treated under Section 201 will not be incorporated into the roadway unless specified in the slash treatment method. Maintain drainage during pioneering operations.

Remove snow and ice in advance of the work and deposit beyond the roadway limits in a manner that will not waste material or generate sediment. Do not incorporate snow and ice into embankments. Place snow or ice in a manner to prevent resource damage.

(d) Drainage Feature. Drainage feature includes construction of all ditches, minor channel changes, drainage dips, catch basins, surface water deflectors, and other minor drainage structures. Compact the material according to Subsection 204.11. Excavate on a uniform grade between control points.

Do not disturb material and vegetation outside the construction limits. Retrieve material deposited outside the construction limits. Dispose of unsuitable or excess excavation material according to Subsection 204.14. Replace shortage of suitable material caused by premature disposal of roadway excavation.

Shape to drain and compact the work area to a uniform cross-section at the end of each day's operations.

204.07 Subexcavation. Excavate material to the required limits. Dispose of unsuitable material according to Subsection 204.14. Take cross-sections according to Section 152. Backfill subexcavated area with suitable material in horizontal layers not exceeding 12 inches (300 millimeters) in compacted thickness and compact according to Subsection 204.11. Prevent unsuitable material from mixing with suitable backfill material.

204.08 Borrow Excavation. Use suitable roadway excavation in embankment construction. Do not use borrow excavation when it results in excess roadway excavation. Deduct excess borrow excavation from the total borrow excavation quantity.

Obtain borrow source approval according to Subsection 105.02. Develop and restore borrow sources according to Subsections 105.03 and 105.06. Do not excavate beyond the established limits. When applicable, shape the borrow source to permit accurate measurements when excavation is complete.

204.09 Preparing Foundation for Embankment Construction. Prepare foundation for embankment construction as follows:

(a) Embankment over natural ground. Remove topsoil and break up the ground surface to a minimum depth of 6 inches (150 millimeters) by plowing or scarifying. Compact the ground surface according to Subsection 204.11.

(b) Embankments over an existing asphalt, concrete, or gravel road surface. Scarify gravel roads to a minimum depth of 6 inches (150 millimeters). Scarify or pulverize asphalt and concrete roads to 6 inches (150 millimeters) below the pavement. Reduce particles to a maximum size of 6 inches (150 millimeters) and produce a uniform material. Compact the surface according to Subsection 204.11.

(c) Embankment across ground not capable of supporting equipment. Dump successive loads of embankment material in a uniformly distributed layer to construct the lower portion of the embankment. Limit the layer thickness to the minimum depth necessary to support the equipment.

(d) Embankment on an existing slope steeper than 1V:3H. Cut horizontal steps in the existing slope to a sufficient width to accommodate placement and compaction operations and equipment. Step the slope as the embankment is placed and compacted in layers. Begin each step at the intersection of the original ground and the vertical cut of the previous step.

204.10 Embankment Construction. Incorporate only suitable roadway excavation material into the embankment. When the supply of suitable roadway excavation is exhausted, furnish unclassified borrow to complete the embankment. Obtain written approval before beginning construction of embankments over 6 feet (2 meters) high at subgrade centerline. Construct embankments as follows:

(a) General. At the end of each day's operations, shape to drain and compact the embankment surface to a uniform cross-section. Eliminate ruts and low spots that could hold water.

During all stages of construction, route and distribute hauling and leveling equipment over the width and length of each layer of material.

Compact embankment side slopes with a tamping foot roller, by walking with a dozer, or by over-building the fill and then removing excess material to the final slope line. For slopes 1V:1¾H or steeper, compact the slopes as embankment construction progresses.

Operate spreading equipment and loaded hauling equipment over the entire surface of embankment.

(b) Embankment within the roadway prism. Place embankment material in horizontal layers not exceeding 12 inches (300 millimeters) in compacted thickness. Incorporate oversize boulders or rock fragments into the 12-inch (300-millimeter) layers by reducing them in size or placing them individually as required below. Compact each layer according to Subsection 204.11 before placing the next layer.

Material composed predominately of boulders or rock fragments too large for 12-inch (300-millimeter) layers may be placed in layers up to 24 inches (600 millimeters) thick. Incorporate oversize boulders or rock fragments into the 24-inch (600-millimeter) layer by reducing them in size or placing individual rock fragments and boulders greater than 24 inches (600 millimeters) in diameter as follows:

(1) Reduce rock to less than 48 inches (1200 millimeters) in the largest dimension, when applicable;

(2) Distribute rock within the embankment to prevent nesting;

(3) Place layers of embankment material around each rock to a depth not greater than that permitted above. Fill voids between rocks; and

(4) Compact each layer according to Subsection 204.11(a) before placing the next layer.

(c) Embankment outside of roadway prism. When placing embankment outside the staked roadway prism, place material in horizontal layers not exceeding 24 inches (600 millimeters) in compacted thickness. Compact each layer according to Subsection 204.11.

204.11 Compaction. Compact the embankment using one of the following methods as specified.

(a) Placement Method 1. Use AASHTO T 27 to determine the quantity of material retained on a No. 4 (4.75-millimeter) sieve. Compact as follows:

(1) More than 80 percent retained on a No. 4 (4.75-millimeter) sieve. Adjust the moisture content to a level suitable for compaction. Fill the interstices around rock with earth or other fine material as practical. Use compression-type rollers at speeds less than 6 feet (1.8 meters) per second and vibratory rollers at speeds less than 3 feet (1 meter) per second. Compact each layer of

material full width with one of the following and until there is no visible evidence of further consolidation:

(a) Four roller passes of a vibratory roller having a minimum dynamic force of 40,000 pounds (180 kilonewtons) impact per vibration and a minimum frequency of 1000 vibrations per minute;

(b) Eight roller passes of a 20-ton (20-metric ton) compression-type roller; or

(c) Eight roller passes of a vibratory roller having a minimum dynamic force of 30,000 pounds (130 kilonewtons) impact per vibration and a minimum frequency of 1000 vibrations per minute.

Increase the compactive effort for layers deeper than 12 inches (300 millimeters) as follows:

- For each additional 6 inches (150 millimeters) or fraction thereof, increase the number of roller passes in Subsection 204.11(a)(1)(a), by four passes; or

- For each additional 6 inches (150 millimeters) or fraction thereof, increase the number of roller passes in Subsection 204.11(a)(1)(b) and (c), by eight passes.

(2) 50 to 80 percent retained on a No. 4 (4.75-millimeter) sieve. Classify the material according to AASHTO M 145. Adjust the moisture content of material classified A-1 through A-5 to a moisture content suitable for compaction. Adjust the moisture content of material classified A-6 and A-7 to within 2 percent of the optimum moisture content. Use AASHTO T 99 to determine the optimum moisture content of the portion of the material passing a No. 4 (4.75-millimeter) sieve. Multiply this number by the percentage of material passing a No. 4 (4.75-millimeter) sieve, and add 2 percent to determine the optimum moisture content of the material.

Use nonvibratory rollers at speeds less than 6 feet (1.8 meters) per second and vibratory rollers at speeds less than 3 feet(1 meter) per second. Compact each layer of material full width according to Subsection 204.11(a)(1).

(3) Less than 50 percent retained on a No. 4 (4.75-millimeter) sieve. Classify the material according to AASHTO M 145. For material classified A-1 or A-2-4, determine the maximum density according to AASHTO T 99, Method C.

Adjust the moisture content of material classified A-1 through A-5 to a moisture content suitable for compaction. Adjust the moisture content of material classified A-6 and A-7 to within 2 percent of the optimum moisture content.

Use compression-type or vibratory rollers. Compact each layer of material full width to at least 95 percent of the maximum density. Determine the in-place density and moisture content according to AASHTO T 310 or other approved test procedures. When required, use AASHTO T 224 to correct for coarse particles.

(b) Placement Method 2. Adjust the moisture content of the material to a moisture content suitable for compaction. Fill the interstices around rock with earth or other fine material as practical. Operate roller compaction equipment over the full width of each layer until there is no visible evidence of further consolidation or, if when a sheepsfoot roller is used, the roller "walks out" of the layer. Make at least three complete passes. Use compression-type rollers at speeds less than 6 feet (1.8 meters) per second and vibratory rollers at speeds less than 3 feet (1 meter) per second. Ensure rollers meet the following requirements:

(1) Steel wheeled rollers, other than vibratory, capable of exerting a force of not less than 250 pounds per inch (4.5 kilogram/millimeter) of width of the compression roll or rolls.

(2) Vibratory steel wheeled rollers equipped with amplitude and frequency controls with a minimum dynamic force of 30,000 pounds (130 kilonewtons) impact per vibration, specifically designed to compact the material on which it is used.

(3) Pneumatic-tired rollers with smooth tread tires of equal size that will provide a uniform compacting pressure for the full width of the roller and capable of exerting a ground pressure of at least 80 psi (550 Kilopascals).

(4) Sheepsfoot, tamping, or grid rollers capable of exerting a force of 250 pounds per inch (4.5 kilogram/millimeter) of width of roller drum.

(c) Placement Method 3. Adjust the moisture content of the material to a moisture content suitable for compaction. Fill the interstices around rock with earth or other fine material as practical. Operate hauling and spreading equipment uniformly over the full width of each layer until there is no visible evidence of further consolidation. Make at least three complete passes.

(d) Placement Method 4. Adjust the moisture content of the material to a moisture content suitable for compaction. Fill the interstices around rock with earth or other fine material as practical. Operate hauling and spreading equipment uniformly over the full width of each layer.

(e) Placement Method 5. Adjust the moisture content of the material to a moisture content suitable for compaction. Compact the complete surface with a bucket of an excavator larger than 39,000 pounds (18 metric ton) Gross Vehicle Weight using a minimum of three blows. Overlap compaction by ½ width of bucket.

(f) Placement Method 6. Adjust the moisture content of the material to a moisture content suitable for compaction. Compact using an approved mechanical tamper for a minimum of three complete passes.

When compacting with rollers or hauling and spreading equipment is not practical, use approved mechanical tampers for a minimum of three complete passes.

204.12 Drainage Features. Slope, grade, and shape all drainage features. Remove projecting roots, stumps, rock, or similar matter. Maintain all drainage features in an open condition and without sticks, and other debris.

Form furrow ditches by plowing or using other acceptable methods to produce a continuous furrow. Place excavated material on the downhill side so the bottom of the ditch is approximately 18 inches (450 millimeters) below the crest of the loose material. Clean the ditch using a hand shovel or other suitable method. Shape to provide drainage without overflow.

204.13 Sloping, Shaping, and Finishing. Complete subgrade, slopes, drainage features, culverts, riprap, and other underground minor structures before placing aggregate courses. Slope, shape, and finish to the designated tolerance class as defined in Table 204-2 as follows:

(a) Sloping. Leave earth slopes with uniform roughened surfaces, except as described in Subsection 204.13(b), with no noticeable break as viewed from the road. Except in solid rock, round tops and bottoms of slopes including the slopes of drainage ditches. Round material overlaying solid rock to the extent practical. Scale rock slopes. Slope rounding is not required on tolerance class D through M roads.

If a slide or slipout occurs on a cut or embankment slope, remove or replace the material and repair or restore damage to the work. Bench or key the slope to stabilize the slide. Reshape the cut or embankment slope to an acceptable condition.

(b) Stepped slopes. Where required, construct steps on slopes of 1⅓V:1H to 1V:2H. Construct the steps approximately 18 inches (450 millimeters) high. Blend the steps into natural ground at the end of the cut. If the slope contains non-rippable rock outcrops, blend steps into the rock. Remove loose material found in transitional area. Except for removing large rocks that may fall, scaling stepped slopes is not required.

(c) Shaping. Shape the subgrade to a smooth surface and to the cross-section required. Shape slopes to gradually transition into slope adjustments without noticeable breaks. At the ends of cuts and at intersections of cuts and embankments, adjust slopes in the horizontal and vertical planes to blend into each other or into the natural ground.

(d) Finishing. Ensure that the subgrade is visibly moist during shaping and dressing; smooth and uniform, and shaped to conform to the typical sections. Remove material larger than 6 inches (150 millimeters) from the top 6 inches (150 millimeters) of the roadbed. Remove unsuitable material from the roadbed, and replace it with suitable material. Scarify to 6 inches (150 millimeters) below the bottom of low sections, holes, cracks, or depressions and bring back to grade with suitable material.

Maintain proper ditch drainage.

204.14 Disposal of Unsuitable or Excess Material. Dispose of unsuitable or excess material at designated sites or according to Subsection 203.05(a)

When there is a pay item for waste, shape and compact the waste material in its final location. Do not mix clearing or other material not subject to payment with the waste material.

204.15 Acceptance. See Table 204-1 for sampling, testing, and acceptance requirements.

Material for embankment and conserved topsoil will be evaluated under Subsections 106.02 and 106.04.

Excavation and embankment construction will be evaluated under Subsections 106.02 and 106.04.

Subexcavation will be evaluated under Subsections 106.02 and 106.04.

Measurement

204.16 Measure the Section 204 pay items listed in the bid schedule according to Subsection 109.02 and the following as applicable:

(a) Roadway excavation. Measure roadway excavation in its original position as follows:

(1) Include the following volumes in roadway excavation:

(a) Roadway prism excavation;

(b) Rock material excavated and removed from below subgrade in cut sections;

(c) Unsuitable material below subgrade and unsuitable material beneath embankment areas when a pay item for subexcavation is not listed in the bid schedule;

(d) Ditches, except furrow ditches measured under a separate pay item;

(e) Conserved topsoil;

(f) Borrow material used in the work when a pay item for borrow is not listed in the bid schedule;

(g) Loose scattered rocks removed and placed as required within the roadway;

(h) Conserved material taken from pre-existing stockpiles and used in Section 204 work, except topsoil measured under 624; and

(i) Slide and slipout material not attributable to the Contractor's method of operation.

(2) Do not include the following in roadway excavation:

(a) Overburden and other spoil material from borrow sources;

(b) Overbreakage from the backslope in rock excavation;

(c) Water or other liquid material;

(d) Material used for purposes other than required;

(e) Roadbed material scarified in place and not removed;

(f) Material excavated when stepping cut slopes;

(g) Material excavated when rounding cut slopes;

(h) Preparing foundations for embankment construction;

(i) Material excavated when benching for embankments;

(j) Slide or slipout material attributable to the Contractor's method of operation;

(k) Conserved material taken from stockpiles constructed at the option of the Contractor;

(l) Material excavated outside the established slope limits; and

(m) Road pioneering for the convenience of the Contractor.

(3) When both roadway excavation and embankment construction pay items are listed in the bid schedule, measure roadway excavation only for the following:

(a) Unsuitable material below subgrade in cuts and unsuitable material beneath embankment areas when a pay item for subexcavation is not listed in the bid schedule;

(b) Slide and slipout material not attributable to the Contractor’s method of operations; and

(c) Drainage ditches, channel changes, and diversion ditches.

(b) Unclassified borrow, and topping. When measuring by the cubic yard (cubic meter) measure in its original position. If borrow excavation is measured by the cubic yard (cubic meter) in-place, take initial cross-sections of the ground surface after stripping overburden. Upon completion of excavation and after the borrow source waste material is returned to the source, retake cross-sections before replacing the overburden. Do not measure borrow excavation until suitable roadway excavation is depleted.

(c) Embankment construction. Measure embankment construction in its final position. Do not make deductions from the embankment construction quantity for the volume of minor structures.

(1) Include the following volumes in embankment construction:

(a) Roadway embankments;

(b) Material used to backfill subexcavated areas, holes, pits, and other depressions;

(c) Material used to restore obliterated roadbeds to original contours; and

(d) Material used for dikes, ramps, mounds, and berms.

(2) Do not include the following in embankment construction:

(a) Preparing foundations for embankment construction;

(b) Adjustments for subsidence or settlement of the embankment or of the foundation on which the embankment is placed; and

(c) Material used to round fill slopes.

(d) Rounding cut slopes. If a pay item for slope rounding is included in the bid schedule measure rounding cut slopes horizontally along the centerline of the roadway. If a pay item is not included for slope rounding is not included in the bid schedule payment will be considered indirect to roadway excavation.

(e) Waste. Measure waste by the cubic yard (cubic meter) in its final position. Take initial cross-sections of the ground surface after stripping over-burden. Upon completion of the waste placement, retake cross-sections before replacing overburden.

(f) Slope scaling. Measure slope scaling by the cubic yard (cubic meter) in the hauling vehicle.

(g) Subexcavation. Measure subexcavation by the cubic yard (cubic meter) in its original position.

(h) Drainage features. Measurement includes all excavation, embankment, shaping, and grading necessary for a completed drainage feature.

Payment

204.17 The accepted quantities will be paid at the contract price per unit of measurement for the Section 204 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Table 204-1
Sampling, Testing, and Acceptance Requirements

Material or Product (Subsection)	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Source								
Topping (704.05)	Measured and tested for conformance (106.04 & 105)	Classification[1]	–	AASHTO M 145	1 per soil type and source of material	Processed material	Yes	Before using in work
Unclassified borrow (704.06)	"	"	–	"	"	"	"	"
Production								
Topping (704.05) and (204.11(a))	Measured and tested for conformance (106.04)	Moisture-density	–	T 99, Method C[2]	1 per soil type, but not less than 1 per each 13,000 yd^3 (10,000 m^3)	Processed material	Yes	Before using in work
		Density	–	AASHTO T 310 or other approved procedures	1 per 3500 yd^2 (3000 m^2), but not less than 3 per layer	In-place	No	Before placement of next layer
Unclassified borrow (704.06) and (204.11(a))	"	Moisture-density	–	T 99, Method C[2]	1 per soil type, but not less than 1 per each 13,000 yd^3 (10,000 m^3)	Processed material	Yes	Before using in work
		Density	–	AASHTO T 310 or other approved procedures	1 per 3500 yd^2 (3000 m^2), but not less than 3 per layer	In-place	No	Before placement of next layer
Production (continued)								

Table 204-1
Sampling, Testing, and Acceptance Requirements

Material or Product (Subsection)	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Earth embankment (204.11(a))	Measured and tested for conformance (106.04)	Classification	–	AASHTO M 145	1 per soil type	Source of material	Yes	Before using in work
		Moisture-density	–	T 99, Method C(2)	1 per soil type, but not less than 1 per each 13,000 yd^3 (10,000 m^3)	"	"	"
		Density	–	AASHTO T 310 or other approved procedures	1 per 3500 yd^2 (3000 m^2), but not less than 3 per layer	In-place	No	Before placement of next layer
Top of subgrade (204.11(a))	"	Density	–	AASHTO T 310 or other approved procedures	1 per 2500 yd^2 (2000 m^2), but not less than 3 per layer	In-place	No	Before placement of next layer
Finished Product								
Roadbed (204.13)	Measured and tested for conformance (106.04)	Final line & grade	–	Field measured	Determined by the CO	Determined by the CO	No	Before placement of next layer

(1) Not required when using Government-provided source.
(2) Minimum 5 points per proctor.

Table 204-2
Construction Tolerances

Location Description	Tolerance Class (a)												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Roadbed width (ft)	+0.5	+0.5	+1.0	+1.0	+1.0	+1.0	+1.5	+1.0	+2.0	+2.0	+2.0	+2.0	+2.0
Subgrade elevation (ft)	±0.1	±0.2	±0.2	±0.5	±0.5	±1.0	±1.0	±1.5	±2.0	±3.0	±2.0	±3.0	(c)
Centerline alignment (ft)	±0.2	±0.2	±0.5	±0.5	±1.0	±1.0	±1.5	±1.5	±2.0	±3.0	±3.0	±5.0	(c)
Slopes, excavation, and embankment (% slope[b])	±3	±5	±5	±5	±5	±5	±10	±10	±10	±10	±20	±20	±20

(a) Maximum allowable deviation from construction stakes and drawings.
(b) Maximum allowable deviation from staked slope measured from slope stakes or hinge points.
(c) Unless otherwise shown the centerline alignment and subgrade elevation, as built, have no horizontal curves with a radius of less than 80 feet, and no vertical curves with a curve length of less than 80 feet when the algebraic difference in the grade change is less than 10 percent, or a curve length of less than 100 feet when the algebraic difference of the grade change is greater than or equal to 10 percent. The centerline grade is not to exceed 20 percent in 100 feet of length.

208 - Structure Excavation and Backfill for Selected Major Structures

208.07_National_11_8_2016

Add the following to Subsection 208.07:

208.07 Dewatering.

Construct diversions according to Subsection 157.10 Diversions. Submit dewatering plans according to Subsection 104.03.

208.03, 208.05, 208.07, 208.09, 208.11, 208.12, 208.13_ANF_08_05_2009

208.03 General.

Add the following:

Stockpile the material as directed by the CO.

Add the following to the end of the second sentence of the first paragraph:

"...to the CO a minimum of 5 days prior to beginning excavation work."

Add the following to the end of the third sentence of the first paragraph:

"...to the CO a minimum of 15 days prior to installation."

208.05 Cofferdams.

Add the following:

Cofferdams may include sandbag dikes. The Contractor shall provide information relative to a source site for any fill material within the cofferdams, a construction method for the cofferdams, and a restoration method for the cofferdams to the CO 15 days prior to construction for review and approval. Dredging of channel material outside of the limits of riprap for use in cofferdams shall not be permitted.

208.07 Dewatering.

Add the following:

The contractor shall submit a dewatering plan to the CO a minimum of 15 days prior to commencement of the work. The plan shall include all means and methods for diverting the flow in the channel as required to construct the footings and reconstruct the channel. Outflow from diversion/dewatering shall not be discharged directly into the creek, but shall be discharged with best management practices for erosion control (refer to Special Contract Requirement 157).

208.08 Foundation Preparation.

Add the following:

The Contractor shall have the foundation subgrade approved by the CO prior to placement of the footings.

208.09(d) Unstable material below footing elevation

Add the following:

The foundation elevation is defined as the top of footings, for spread footing placement. Bottom of footing elevation is the resulting design elevation at the bottom of the footing. Boulders or irregular, fractured, or seamed rock is anticipated to preclude excavation to the bottom of footing elevations and these obstructions shall be removed and replaced with foundation fill. Foundation fill shall be placed with a minimum depth of 6” to provide a level bearing surface. Foundation fill required beyond the 1’-0” depth shown on the plans shall not be measured separately subject to Section 208.12 (below). The additional structure excavation for the 1’-0” depth foundation fill shall be to the same horizontal limits defined in Section 208.12(a) and shall be measured and included for payment in the associated pay item. Structure excavation below the 1’-0” foundation fill shall not be measured separately and shall be considered incidental to the work to the limits defined in Section 208.14.

208.09 Backfill.

Add the following:

Construct backfill equally on both sides of the structure as recommended by the manufacturer.

208.11 Acceptance.

Add the following:

Provide reports/results of structural backfill compaction tests to the CO.

208.12 Measurement.

Add the following paragraphs:

Foundation fill material required to replace additional excavation beyond the 6” depth shown on the plans shall not be measured for payment unless the material required exceeds 15% of the contract quantity for foundation fill.

Material required for the approved dewatering method will not be measured for payment.

208.13 Payment.

Add the following paragraph:

All material, labor, equipment, and incidentals required to install and remove the approved diversion and dewatering system shall not be paid for separately, but shall be included in the following item:

20801 Structure excavation	*Cubic yard*

209 - Structure Excavation and Backfill

209.07_Forest_10_31_2017

209.07 Dewatering.

Add the following:

Do not pump water from foundation excavations directly into live streams or marine waters. Pump water into settling areas as specified in the contract.

209.09_National/ANF_7_18_2017

Make the following Changes to Subsection 209.09:

209.09 Backfill.

Add the following to Subsection 209.09(a):

(a) General.

Backfill without damaging or displacing the culvert or structural plate structure. Replace any pipe that is distorted by more than 5 percent of nominal dimensions, or that is ruptured or broken.

Add the following to Subsection 209.09(b)

(b) Pipe culverts.

Do not place or backfill pipe that meets any of the following conditions until the excavation and foundation have been approved in writing by the CO:

- Embankment height greater than 4 feet at subgrade centerline.
- Installation in a protected stream course.
- Round pipe with a diameter of 36 inches or greater.
- Pipe arch culverts with a span of 40 inches or greater.
- Any box culvert or structure other than pipe culverts.

209.10_National_7_17_2017

Delete Subsection 209.10 and replace with the following:

209.10 Compacting.

Compact the embankment using one of the following methods as specified.

(a) Compaction Method 1. Use AASHTO T 27 to determine the quantity of material retained on a No. 4 (4.75-millimeter) sieve. Compact as follows:

(1) More than 80 percent retained on a No. 4 (4.75-millimeter) sieve. Adjust the moisture content to a level suitable for compaction. Fill the interstices around rock with earth or other fine material as practical. Use compression-type rollers at speeds less than 6 feet (1.8 meters) per second and vibratory rollers at speeds less than 3 feet (1 meter) per second. Compact each layer of material full width with one of the following and until there is no visible evidence of further consolidation:

(a) Four roller passes of a vibratory roller having a minimum dynamic force of 40,000 pounds (180 kilonewtons) impact per vibration and a minimum frequency of 1000 vibrations per minute;

(b) Eight roller passes of a 20-ton (20-metric ton) compression-type roller; or

(c) Eight roller passes of a vibratory roller having a minimum dynamic force of 30,000 pounds (130 kilonewtons) impact per vibration and a minimum frequency of 1000 vibrations per minute.

Increase the compactive effort for layers deeper than 12 inches (300 millimeters) as follows:

- For each additional 6 inches (150 millimeters) or fraction thereof, increase the number of roller passes in Subsection 209.10(a)(1)(a), by four passes; or

- For each additional 6 inches (150 millimeters) or fraction thereof, increase the number of roller passes in Subsection 209.10(a)(1)(b) and (c), by eight passes.

(2) 50 to 80 percent retained on a No. 4 (4.75-millimeter) sieve. Classify the material according to AASHTO M 145. Adjust the moisture content of material classified A-1 through A-5 to a moisture content suitable for compaction. Adjust the moisture content of material classified A-6 and A-7 to within 2 percent of the optimum moisture content. Use AASHTO T 99 to determine the optimum moisture content of the portion of the material passing a No. 4 (4.75-millimeter) sieve. Multiply this number by the percentage of material passing a No. 4 (4.75-millimeter) sieve, and add 2 percent to determine the optimum moisture content of the material.

Use nonvibratory rollers at speeds less than 6 feet (1.8 meters) per second and vibratory rollers at speeds less than 3 feet(1 meter) per second. Compact each layer of material full width according to Subsection 209.10(a)(1).

(3) Less than 50 percent retained on a No. 4 (4.75-millimeter) sieve. Classify the material according to AASHTO M 145. For material classified A-1 or A-2-4, determine the maximum density according to AASHTO T 99, Method C..

Adjust the moisture content of material classified A-1 through A-5 to a moisture content suitable for compaction. Adjust the moisture content of material classified A-6 and A-7 to within 2 percent of the optimum moisture content.

Use compression-type or vibratory rollers. Compact each layer of material full width to at least 95 percent of the maximum density. Determine the in-place density and moisture content according to AASHTO T 310 or other approved test procedures. When required, use AASHTO T 224 to correct for coarse particles.

(b) Compaction Method 2. Adjust the moisture content of the material to a moisture content suitable for compaction. Fill the interstices around rock with earth or other fine material as practical. Operate roller compaction equipment over the full width of each layer until there is no visible evidence of further consolidation or, if when a sheepsfoot roller is used, the roller "walks out" of the layer. Make at least three complete passes. Use compression-type rollers at speeds less than 6 feet (1.8 meters) per second and vibratory rollers at speeds less than 3 feet (1 meter) per second. Ensure rollers meet the following requirements:

(1) Steel wheeled rollers, other than vibratory, capable of exerting a force of not less than 250 pounds per inch (4.5 kilogram/millimeter) of width of the compression roll or rolls.

(2) Vibratory steel wheeled rollers equipped with amplitude and frequency controls with a minimum dynamic force of 30,000 pounds (130 kilonewtons) impact per vibration, specifically designed to compact the material on which it is used.

(3) Pneumatic-tired rollers with smooth tread tires of equal size that will provide a uniform compacting pressure for the full width of the roller and capable of exerting a ground pressure of at least 80 psi (550 Kilopascals).

(4) Sheepsfoot, tamping, or grid rollers capable of exerting a force of 250 pounds per inch (4.5 kilogram/millimeter) of width of roller drum.

(c) Compaction Method 3. Adjust the moisture content of the material to a moisture content suitable for compaction. Fill the interstices around rock with earth or other fine material as practical. Operate hauling and spreading equipment uniformly over the full width of each layer until there is no visible evidence of further consolidation. Make at least three complete passes.

(d) Compaction Method 4. Adjust the moisture content of the material to a moisture content suitable for compaction. Fill the interstices around rock with earth or other fine material as practical. Operate hauling and spreading equipment uniformly over the full width of each layer.

(e) Compaction Method 5. Adjust the moisture content of the material to a moisture content suitable for compaction. Compact the complete surface with a bucket of an excavator larger

than 39,000 pounds (18 metric ton) Gross Vehicle Weight using a minimum of three blows. Overlap compaction by ½ width of bucket.

(f) Compaction Method 6. Adjust the moisture content of the material to a moisture content suitable for compaction. Compact using an approved mechanical tamper for a minimum of three complete passes.

When compacting with rollers or hauling and spreading equipment is not practical, use approved mechanical tampers for a minimum of three complete passes.

213 - Subgrade Stabilization

213.05_National_11_2_2016

Delete the second paragraph in Subsection 213.05 and replace with the following:

213.05 General.

Prepare the subgrade according to Subsection 303.05. Scarify or pulverize the subgrade to the required depth. Adequately blend the material to produce a homogeneous mixture within 2 percent of the optimum moisture content.

251 – Riprap

251.02, 251.03, 251.04, 251.07_ANF_2_28_2019

251.02 Material.

Add the following:

The material for riprap shall be approved by the CO.

Obtain the riprap from a commercial source.

The contractor shall incorporate on-site material into the riprap when possible. The CO will approve any existing rock material and the method to which it will be incorporated into the riprap.

251.03 General

Replace the first sentence with the following:

Perform the work under section 208.

251.04 Placed Riprap

Add the following:

Place riprap on slopes above the structure according to Standard Specification Section 252.04

251.07 Acceptance

Delete the 8th sentence regarding structure excavation and backfill.

301 - Untreated Aggregate Courses

301.03_National_7_17_2017

Add the following to Subsection 301.03:

301.03 General.

Written approval of the roadbed is required before placing aggregate.

For pit run or grid-rolled material, furnish material smaller than the maximum size, no gradation will be required otherwise. After processing on the road, remove all oversize material from the road and dispose as directed by the CO.

Provide additives or binder, if required, at the proportions specified.

Develop and use Government furnished sources according to Section 105.

If the aggregate is produced and stockpiled before placement, handle and stockpile according to Section 314.

301.05_ANF_2_17_2018

Delete Subsection 301.05 and replace with the following:

301.05 Compacting.

Compact each layer full width. Roll from the sides to the center, parallel to the centerline of the road. Along curbs, headers, walls, and all places not accessible to the roller, compact the material with approved tampers or compactors. Compact the aggregate accordingly to 204.11

For all compaction methods, blade the surface of each layer during the compaction operations to remove irregularities and produce a smooth, even surface.

301.08_Forest_11_1_2017

301.08 Acceptance.

Delete 301.08 (b).

302 - Minor Crushed Aggregate

302.04_National_7_18_2017

Add the following to Subsection 302.04 and 302.04(a)

302.04 Placing Crushed Aggregate.

Written approval of the surface is required before placing aggregate.

(a) Roadway aggregate.
For pit run or grid-rolled material, furnish material smaller than the maximum size, no gradation will be required otherwise. After processing on the road, remove all oversize material from the road and dispose as directed by the CO.

303 - Road Reconditioning

303.00_ANF_02_05_2018

Delete Section 303 in its entirety and replace with the following.

Description

303.01 This work consists of reconditioning ditches, shoulders, roadbeds, parking areas, turnouts, approach road intersections, and aggregate surfaces. Clean and maintain all roadbed drainage structures.

Material

303.02 Conform to the following Subsection:

Water 725.01

Construction Requirements

303.03 Ditch Reconditioning. Remove all slide material, sediment, vegetation, and other debris from the existing ditches and culvert inlets and outlets according to the dimensions and typical in the drawings. Reshape ditches and culvert inlets and outlets to achieve positive drainage and a uniform ditch width, depth, and grade. Dispose of waste at designated sites or according to Subsection 204.14.

303.04 Shoulder Reconditioning. Remove all slide material, vegetation, and other debris from existing shoulders including shoulders of parking areas, turnouts, and other widened areas. Repair soft and unstable areas according to Subsection 204.07. Reshape shoulders to the widths and slopes shown in the typical drawing. Dispose of waste as designated sites or according to Subsection 204.14.

303.05 Roadbed Reconditioning Remove all organic, deleterious material larger than 6 inches from the top 6 inches of subgrade. Dispose of waste at designated sites or according to Subsection 204.14. Repair soft and unstable areas according to Subsection 204.07. Scarify, rip and shape the traveled way and shoulders to a **6**-inch depth. Remove surface irregularities and shape to provide a uniform surface.

Dispose of rock larger than 4 inches brought to the surface during scarification, waste and unusable material as directed by the CO.

For portions of roads not requiring scarification, the roadbed may contain rocks larger than 4 inches provided they do not extend above the finished roadbed surface. Reduce in place or remove rock extending above the finished roadbed surface.

Compact using the method listed under 204.11(2) (Placement Method 2).

303.06 Aggregate Surface Reconditioning. Repair soft and unstable areas to the full depth of the aggregate surface and according to Subsection 204.07. Scarify to the depth of the aggregate surface or to a depth of 8 inches, whichever is less, and remove surface irregularities. Reshape, finish, and compact the entire aggregate surface according to 204.11(2) (Placement Method 2).

303.07 Roadway Reconditioning. Perform all the applicable work described in Subsections 303.03 through 303.06.

Maintain the existing cross slope or crown unless otherwise shown on the drawings. Establish a blading pattern that will retain the surfacing on the roadbed and provide a through mixing of the materials within the completed surface width.

Blade and shape the subgrade for both surfaced and unsurfaced roads when moisture content is suitable for compaction.

303.08 Acceptance. Road reconditioning work will be evaluated under Subsections 106.02 and 106.04.

Measurement

303.09 Measure the Section 303 items listed in the Schedule of Items according to Subsection 109.02 and the following as applicable.

Measure ditch reconditioning and shoulder reconditioning by the mile, by the station or foot horizontally along the centerline of the roadway for each side of the roadway.

Measure roadbed reconditioning, aggregate surface reconditioning, and roadway reconditioning by the mile, by the station, or by the square yard.

Payment

303.10 The accepted quantities will be paid at the contract price per unit of measurement for the Section 303 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

314 - Stockpiled Aggregates

314.00_National_7_18_2017

Add the following to Subsection 314.01:

314.01 Description.
Pit or quarry development work consists of clearing, grubbing, stripping topsoil, removing overburden, constructing access roads, conducting restoration activities, and performing other incidental work required for pit or quarry development.

Add the following to Subsection 314.04 after the first sentence of second paragraph:

314.04 Stockpile Site.
Submit a plan of operation according to Section 105.02. Perform the work in accordance with MSHA 30 CFR, part 56.

314.00_ANF_02_28_2019

Description

314.01 This work shall consist of furnishing and placing aggregate in a stockpile at an existing site or constructing a new site and placing the aggregate at the new site.

Material

314.02 Conform to the following Section:

Aggregate	703

Provide the gradation and quality requirements specified in the Section 301 and identified in the pay items.

Construction Requirements

314.03 Stockpile Site. Prepare existing sites as necessary to accommodate the quantity of aggregate to be stockpiled.

For new sites, clear and grub according to Section 201. Grade and shape the site to a uniform cross-section that drains. Compact the site subgrade of the site with at least three passes using compaction equipment conforming to Subsection 204.11. Place, compact, and maintain a minimum 6 inches of crushed aggregate over the stockpile site and access roads. Prevent contamination of the stockpiles.

314.04 Stockpile. After a representative quantity of aggregate is produced, submit proposed target values for the appropriate sieve sizes.
Set target values within the gradation ranges shown in 703 for the required grading.

Obtain site approval from the CO before stockpiling aggregates. Make the stockpiles neat and regular in shape outside the stream's water influence zone to avoid sediment input into the

watercourse or to avoid the loss/damage of riparian vegetation and associated filtering. Make the side slopes no flatter than 1:1.5.

Build the stockpiles in layers not exceeding 3 feet thick. Complete each layer before depositing aggregates in the next layer. Do not allow aggregates from the one layer to run down over lower layers of the stockpile. Do not drop aggregates from a bucket or spout in one location to form a cone-shaped pile.

Construct stockpile layers by spreading aggregates with trucks or other approved pneumatic-tired equipment. Do not push aggregates into piles.

When operating trucks on stockpiles, avoid tracking dirt or other deleterious material onto the stockpiled material.

Space stockpiles far enough apart or separate stockpiles by suitable walls or partitions to prevent the mixing of the different aggregate gradations.

Depose of excess stockpiled materials as directed by the CO.

314.05 Acceptance. Aggregate for stockpiling will be evaluated under Subsection 301.08 and Table 301-1. The point of sampling will be the belt or stockpile.

Preparation of stockpile sites and construction of stockpiles will be evaluated under Subsections 106.02 and 106.04.

Clearing will be evaluated under Section 201.

Measurement

314.06 Measure the Section 314 items per 301 items listed in the bid schedule according to subsection 109.02.

Payment

314.07 The accepted quantities, measured as provided in subsection 109.02 and above, will be paid at the contract price per unit of measurement for the Section 301 pay items listed in the bid schedule and no direct payment shall be made for stockpiled aggregate.

602 - Culverts and Drains

602.03_ANF_02_06_2018

Add the following to Subsection 602.03:

602.03 General.

Ensure that the final installed alignment of all pipe allows no reverse grades, and does not permit horizontal and vertical alignments to vary from a straight line drawn from center of inlet to center of outlet by more than 2 percent of pipe center length or 1.0 feet, whichever is less.

602.05_National_7_7_2017

Add the following to Subsection 602.05.

602.05 Laying Metal Pipe.

(c) Standard Connecting bands. Band corrugation shall match that of the pipe sections being joined or the annular rerolled ends of those pipe sections.

607 - Cleaning, Relaying, and Repairing Existing Drainage Structures

607.01_Forest_1_2_2018

Description

607.01

Add the following:

Removal of excess culvert length

Construction Requirements

607.02 Cleaning Drainage Structures in Place.

Add the following:

If approved by the CO, all or part of the pipe designated to be cleaned in-place may be removed, cleaned, and re-laid in accordance with Section 602. In these cases, furnish all material required to replace damaged pipe and joints and relay the pipe.

Vegetative removal limits for culverts are 3 ft. from inlet and outlet ends.

607.04 Repairing Drainage Structures.

Add the following:

Repair all culverts designated to be cut by removal of the damaged sections and furnish all material required to replace damaged pipe and joints.

624 – Topsoil

624.03, 624.04_ANF_02_28_2019

624.03 Preparing Areas

Replace with the following:

Shape all slopes and disturbed areas to be covered with topsoil. Roughen slopes to a depth of 4 inches. The prepared area shall include locations disturbed during construction activities.

624.04 Placing Topsoil

Add the following:

Place conserved topsoil in the same amount as originally stockpiled according to Section 204.

625 - Turf Establishment

625.00_National/ANF_7_18_2017

Delete Section 625 in its entirety and replace with the following:

Section 625. — TURF ESTABLISHMENT

Description

625.01 This work consists of soil preparation, watering, fertilizing, seeding, and mulching. Seeding and mulching methods are designated as dry or hydraulic.

Material

625.02 Conform to the following Subsections:

Agricultural limestone	713.02
Fertilizer	713.03
Mulch	713.05
Seed	713.04
Tackifiers	713.11
Water	725.01(b)

Construction Requirements

625.03 General. Apply turf establishment to prepared ground or any disturbed area between ***April 15th*** and ***October 15th*.** Apply turf establishment to the areas shown on the plans or worklists within ***7*** days after completion of ground disturbing activities.

Seeded areas damaged by construction activities shall be reseeded within 10 days of the damage. Do not seed during windy weather or when the ground is excessively wet, frozen, or snow covered.

Assure that all seed and mulch used in the work conforms to the weed free requirements of Section 713.

625.04 Preparing Seedbed. Ensure that the surface soil is in a roughened condition favorable for germination and growth.

625.05 Watering. Maintain moisture as follows:
Watering is not required.

625.06 Fertilizing. Apply fertilizer by the following methods:

(a) Dry Method. Apply the fertilizer with approved mechanical equipment. Hand operated methods are satisfactory on areas inaccessible to mechanical equipment.

(b) Hydraulic Method. Use hydraulic-type equipment capable of providing a uniform application using water as the carrying agent. Add fertilizer to the slurry and mix before adding seed. Add the tracer material when designated by the CO.

Apply fertilizer at the rate of **450** pounds per acre. Insure that the fertilizer meets the following chemical analysis:

Nutrient	Percent
Nitrogen, N	**10**
Phosphorus, $P_2 0_5$	**20**
Potassium, K	**20**

625.07 Seeding. Apply seed by the following methods:

(a) Dry Method. Apply the seed with approved power driven seeders, drills, or other mechanical equipment. Hand-operated seeding methods are satisfactory on areas inaccessible to mechanical equipment; or

(b) Hydraulic Method. Use hydraulic-type equipment capable of providing a uniform application using water as the carrying agent. Add a tracer material consisting of either wood or grass cellulose fiber mulch to the water. Apply the tracer material at a rate of 400 pounds per acre (450 kilograms per hectare) to provide visible evidence of uniform application. Add the seed to the water slurry no more than 30 minutes before application. Seed by hand areas inaccessible to seeding equipment.

Furnish and apply the following kinds and amounts of pure live seed:

	Type of Seed	Quantity of Pure Live Seed (Lbs/Acre)
1.	**Spring Oats or Winter Rye**	**1.5 bushels/acre**
2.	**Annual Rye grass**	**5**
3.	**White Dutch Clover w/inoculant**	**5**
4.	**Indiangrass – PA Ecotype**	**3**
5.	**Switchgrass 'Shelter'**	**3**
	Total	**1.5 Bushel/Acres and 16 Lbs/Acre**

	Spring	Fall
Grass	*See mix above	*See mix above
Lime	Agricultural lime @ 2 tons/acre or Pelletized lime @ 400 lbs/acre	Agricultural lime @ 2 tons/acre or Pelletized lime @ 400 lbs/acre
Fertilizer	10-20-20 @ 450lbs/acre	10-20-20 @ 450lbs/acre
Mulch	Straw only @ 60 bales/acre	Straw only @ 60 bales/acre

Determine the pounds of seed to be furnished per acre by dividing the pounds of pure live seed required per acre by the product of the percent purity and percent germination.

625.08 Mulching. Apply Mulch within **24** hours after seeding by the following methods.

(a) Dry Method. Apply mulch with a hand spreader or a spreader utilizing forced air at a rate of **4,000** pounds per acre. Anchor the mulch with an approved stabilizing emulsion tackifier at a rate of **0** gallons per acre. Do not mark or deface structure, pavements, utilities, or plant growth with tackifier.

(b) Hydraulic Method. Apply mulch in a separate application from the seed using hydraulic-type equipment according to Subsection 625.07(b).

Apply wood fiber or grass straw cellulose fiber mulch at a rate of **775** pounds per acre.

Apply bonded fiber matrix hydraulic mulch at a minimum rate of **775** pounds per acre.

Apply so no hole in the matrix is greater than 0.04 inches. Apply so that no gaps exist between the matrix and the soil.

Apply mulch uniformly over the entire disturbed area. Mulch by hand areas inaccessible to mulching equipment.

625.09 Protecting and Caring for Seeded Areas. Protect and care for seeded areas including watering according to 625.05. Repair or apply supplemental applications of seed, mulch, fertilizer, and water according to 625.05 as many times as needed until turf is established or final acceptance.

625.10 Acceptance. Material for turf establishment will be evaluated under Subsections 106.02 and 106.03.

Placing of turf establishment will be evaluated under Subsections 106.02 and 106.04.

Measurement

625.11 Measure the Section 625 pay items listed in the bid schedule according to Subsection 109.02 and the following as applicable:

When measuring turf establishment and supplemental applications by the acre (hectare), measure on the ground surface.

When measuring water by volume or mass, measure in the hauling vehicle or by metering.

Payment

625.12 The accepted quantities will be paid at the contract price per unit of measurement for the Section 625 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

633 - Permanent Traffic Control

633.00_National_11_8_2016

Delete the first sentence of Subsection 633.02 and replace with the following:

633.02 Material.
Conform to the MUTCD, USDA Forest Service EM-7100-15, and the following Section and Subsections:

Make the following changes to Subsection 633.03:

633.03 General.
Delete the first paragraph of Subsection 633.03 and replace with the following:

Furnish and install permanent traffic control devices according to the MUTCD, USDA Forest Service EM-7100-15 and permanent traffic control plans. Provide traffic control devices that are crashworthy.

Add the following sentence to Subsection 633.03:

Sign panel layout proofs shall be approved by the CO prior to ordering.

Add the following to Subsection 633.05(a):

633.05 (a) Fabrication.

(3) Protective Overlay Film. When specified, cover the entire face of a sign with a clear high-performance, solvent-resistant, ultraviolet-stabilized, pressure-sensitive adhesive, protective overlay film. Use 3M Scotchlite Premium Protective Overlay Film Series 1160 or approved equivalent.

(4) Edge Film. When specified, edge film shall be 3 inches wide vinyl film that is pressure-sensitive, premium quality, clear, and ultraviolet-resistant.

635 – Temporary Traffic Control

635.03_ANF_03_01_2019

635.04 General.
Add the following:

Install temporary traffic control signs to temporary posts or approved temporary sign mounts.

The work includes all traffic control for all phases of work

648 - Stream Simulation

648.00_National/ANF_7_18_2017

Add Section 648:

Section 648. — STREAM SIMULATION

Description

648.01 This work consists of placing rock and fill to simulate a natural streambed, profile and cross section though road stream crossings. The placement of channel rock for: fish rest stop, rock bands, rock weirs, stream bank rocks, and other in stream rock structures, is included within this specification.

Material

648.02 Conform to the following Subsections.

Backfill Material	704.03
Stream Bed Simulation Material	705.08
Channel Rock	705.08

Construction Requirements

648.03 General. Place streambed simulation material on a prepared surface to form a well-graded, low permeability mass, similar in appearance and texture to the natural streambed. Do not drive metal track or rubber tired equipment directly on metal or concrete structure surfaces.

648.04 Placed Streambed Simulation Material and Channel Rock. Begin construction from the downstream end working upstream. Changes to construction flow will be allowed on a case by case basis due to poor stream to culvert alignment, traffic requirements, limited access, and preservation of existing trees reinforcing the banks. Deviation from construction flow (downstream to upstream) must be requested in writing and approved by the CO or their designee, 5 days in advance of construction.

Place stream simulation rock in one or more layers with a layer depth less than 1 ½ times the maximum dimension of stream simulation rock, but not greater than 2 ft. Place stream simulation rock by methods that do not cause segregation or damage to the prepared surface. Place or rearrange individual rocks to obtain a uniformly dense, compact, low permeability mass, matching stream simulation bed details. Fill voids by machine or hand tamping before placing the next lift. Compact bed materials by mechanical means such as plate compactors, loaders, etc.

Fill all voids left during placement of Stream Bed Simulation Rock, Fish Rest Stops, (habitat rocks), weirs, banks, and stream bed materials adjacent to footings, concrete structures, or corrugated pipes with foundation fill. Use water pressure, metal tamping rods, and similar hand operated equipment to force material into all surfaces and subsurface voids between the structure and rocks, and between individual rocks.

Notify the CO at least 48 hours in advance of the stream bed material installation.

648.05 Streambed Surface. Fill all voids in the streambed surface left during placement of channel rock and streambed simulation material with backfill material. Use water pressure, metal tamping rods, and similar hand operated equipment to force material into all surface voids.

648.06 Acceptance. Placing streambed simulation material will be evaluated under Subsections 106.02 and 106.04.

Measurement

648.07 Measure the items listed in the bid schedule according to Subsection 109.02.

Payment

648.08 The accepted quantities, measured as provided in Subsection 109.02, will be paid at the contract unit price per unit of measurement for Section 648 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05

648.00_ANF_03_01_2019

Add Section 648:

Section 648. — STREAM SIMULATION

Description

648.01 This work consists of furnishing and installing alluvium, rock, logs, trees, rootwads and specified fill to simulate natural stream profile, grade control structures, and streambed through culverts, bridge structures, and existing stream channels. Work includes developing materials; hauling materials; dewatering; sediment control; placing bedding and backfill to construct stream simulation channels inside and outside of the structures (culverts, bridges, existing channels); placing, keying, sealing, and compacting designed streambed fill; constructing instream structures (steps, pools, riffles, ribs, banks); reconstructing existing channels; and all other streambed work to complete the project.

Material

648.02 Conform to the following Section and Subsections:

Foundation Fill.....704.01
Streambed Simulation Rock 705.07
Channel Rock 705.08

Furnish instream structures materials (boulders, boulder clusters, ribs, steps, riffles, etc) and stream simulation streambed mix with the sizes and gradations as required in the contract.

Provide native log materials that are green, sound, and free of cracks or defects that would affect structural integrity or accelerate decay.

Sort material for streambed simulation rock by screening (power screen or grizzly/stationary screen) as shown on the plans. Large particles may be machine sorted by heavy equipment or hand labor.

Mix streambed simulation rock in proportions based on Table 705-4. All streambed material will be similar in shape / angularity as those found in the natural stream channel or as designated in

the specifications. Tolerance for material gradation is + or – 5% for each screen size listed in the gradation.

Provide streambed simulation rock and channel rock that is durable and at least as angular as those found in the natural stream channel or as SHOWN ON THE PLANS.

Do not use rounded channel rock in the construction of banks or steps within the culvert or bridge structure. Rounded channel rocks may be used outside the culvert or bridge structure if approved by the CO in the field.

Request approval of rock to be used for steps, banks and all grade control structures 3 days prior to scheduled placement.

Construction

648.03 General. Place streambed simulation rock on a prepared surface to form a well-graded, low permeability mass, similar in appearance and form to the natural stream channel or as required in the contract.

648.04 Equipment Operations.
An oil spill containment kit is required on each job site when working in and around the stream. Composition of the kit is dependent on the job; determine contents of the kit as needed for each job. At a minimum, include tarps and oil-absorbent pads. Provide floating oil boom downstream of the work site.

648.05 Equipment Limitations.

Do not drive metal track or rubber tired equipment directly on metal or concrete structure surfaces. Place a layer of streambed mix material on the structure bottom before operating metal track or rubber tired equipment directly on metal or concrete structure surfaces.

648.06 Excavation. Control excavated material to minimize disturbance to the adjacent channel and banks. Incorporate suitable streambed materials into the project if required gradations are accordance with contract specifications.

Specific culvert installation time restrictions and installation plan requirements are indicated in the contract.

648.07 Dewatering. Dewatering or diversions are required for construction and adjacent instream work in addition to complete reconstruction of the channel. Dewatering is not required when constructing isolated or infrequent structures such as single rock or log step and other instream structures in channel reconstruction areas outside 25 feet from the inlet or outlet of the structure. Customize dewatering to the site depending on flow, ground water depths at the time of installation, terrain configuration, and culvert embedment depths. Submit a dewatering plan 15 days in advance of construction. Include in the plan the method (bypass or pumping), number of pumps and capacity required, pump and bypass culvert calculations, location/layout of dewatering operations and equipment, and erosion control measures for dealing with the return flow back to the existing stream channel. The plan will be approved by the CO within 15 calendar days of plan submission.

Maintain the dewatering pumping operations to ensure return flow does not exceed State water quality standards. Water pumped from the construction site may require additional filtration by filter bags or other methods (settling basins, gravel filters, etc) to prevent turbid water from directly entering the stream.

Place additional measures or cease operations until the discharge reaches allowable levels when turbidity exceeds State water quality standards.

Relocate fish contained within the cofferdams before the site is completely dewatered. Place relocated fish in the closest pool upstream of the construction zone.

If trash pumps are used during construction, the intake must be operated and maintained to prevent fish entrapment, entrainment, or injury with the use of perforated or slotted plate and woven wire with a mesh size not greater than 3/32 inch or a profile bar and wedgewire with openings not greater than 1/16 inch. Approach velocities shall not exceed a passive velocity of 0.2 feet per second (fps) or an active velocity 0.4 fps.

648.08. Rewatering. Conduct rewatering activities to minimize sediment movement downstream of the site upon completion of instream work. Prior to rerouting stream flow into the new channel, rinse the surface of the streambed to removed fine-grained sediment. After the initial sediment pulse is removed, slowly breach the coffer/diversion dams to avoid a large pulse of water being sent through the newly constructed channel.

648.09 Blasting and Rock Removal. Remove bedrock encountered during excavation to the lines and grades required in the contract. Remove rock by either mechanical means with hydraulic impact hammers / rock breakers, by ripping, or blasting. When explosives are used, do not cause mortality to juvenile fish by transmitting excessive blasting overpressures through the ground to the fish habitat. Limit blasting overpressures to a maximum of 2 psi in fish habitat.

648.10 Placed Streambed Simulation Material. Begin construction from the downstream end working upstream. Changes to this sequence will be allowed on a case by case basis due to poor stream to culvert alignment, traffic requirements, limited access, and preservation of existing trees reinforcing the banks.

Place streambed simulation rock in one or more layers with a maximum layer depth less than 1 ½ times the average dimension of the B-axis of the streambed simulation rock, but no greater than 2ft. Place streambed simulation rock by methods that do not cause segregation or damage to the prepared surface. Place or rearrange individual rocks to obtain a uniformly dense, compact, low permeability mass, matching streambed simulation details. Fill voids by machine or hand tamping before placing the next lift. Compact streambed materials by mechanical means such as hand or excavator operated vibratory plate compactors.

Fill all voids left during placement of streambed simulation rock, boulders, steps, ribs, banks and streambed materials adjacent to footings, concrete structures or corrugated pipes with foundation fill. Use water pressure, metal tamping rods, and similar hand operated equipment to force material into all surfaces and subsurface voids between the structure and rocks, and between individual rocks. Ensure the streambed is sealed to limit permeability.

Notify the CO at least 48 hours in advance of the streambed material installation.

648.11 Rock Bedforms (steps, ribs, riffles), Forcing Features (boulders, boulder clusters), and Bank Construction. Construct bedforms and banks as specified in the contract. Construction will proceed from downstream to upstream. Machine or hand place banks, steps, and ribs and key in place with select key pieces of the required size class, along with smaller materials of varying sizes to fill voids. Construct low flow channel through the center of the channel AS SHOWN ON THE DRAWINGS. Place steps and ribs so the tops are uneven, containing several high and low points to concentrate water during low flows. Place step and rib surfaces so they are higher at the outside edge of the culvert (culvert wall) and slope down to the outside edge of the constructed low flow channel AS SHOWN ON THE PLANS.

Construct steps with footer rocks placed before the top step rocks are installed. Use footer rocks which are the same size class as the top step rocks. Fill all voids with smaller materials as construction progresses to minimize permeability.

Construct banks out of large blocky key pieces of the required size class AS SHOWN ON THE DRAWINGS. Key and lock smaller materials of varying sizes to fill voids. Bank materials will be hand keyed in place and compacted depending on the size of materials used as designated in the field by the CO. Construct bank faces to be uneven, protrude into the channel, and be rough in appearance. Construct the top of the bank to be fairly uniform. Tie back constructed banks and margins at the edge of the structure walls into the existing stream banks at dimensions similar to those found in the reference reach or AS SHOWN ON THE DRAWINGS.

When single rocks are used as roughness elements and habitat diversity, bury to 50% of the diameter or as SHOWN ON THE PLANS. Fill and compact voids around these structures. When constructed as clusters of particles, key pieces within the cluster will be buried 50% of the diameter or as SHOWN ON THE PLANS.

Notify the CO at least 48 hours in advance of the installation of any streambed, bedform, roughness feature, log structure, or bank construction.

648.12 Log and Root Wad Structures. Locate and place log structures as required in the contract, and/or designated in the field by the CO.

Construct log weirs with cross slope gradients not less than 5(H):1(V), unless SHOWN ON THE DRAWINGS or staked in the field by the CO, and maximum tolerance of 6(H):1(V), unless approved in writing by the CO.

Embed log weirs to a minimum depth of 10 feet beyond bank full widths or half bankfull width on each side, whichever is greater or AS SHOWN ON THE DRAWINGS. When placing habitat logs (overhanging a portion of the stream) that lay on the banks, ensure 2/3 of the log remain behind bankful width on top of the bank.

Embed rootwad revetment trunks a minimum of 10 feet behind bankfull width limits or as SHOWN ON THE DRAWINGS. Bury the root to a point where the base of the bol is resting in the bottom of the bank or as required in the contract, and/or designated in the field by the CO.

Measurement

648.13 Method. Measure the Section 648 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

Channel construction per linear unit includes furnishing and installing all rock and work associated with simulation streambed construction and includes the installation of rock steps, ribs, pools, banks, riffles, boulders/boulder clusters and miscellaneous rock structures.

All log structures and rootwad revetment will be measured separately for payment if designated on the schedule of items.

Instream structures composed of rock and wood will be measured separately for payment if designated on the schedule of items.

Do not measure dewatering and diversions, they are considered incidental to construction of the structures unless measured separately for payment if designated on the schedule of items.

Work and materials required for stream simulation are considered incidental to installation of the structure unless designated on the schedule of items.

Payment

648.14 Basis. The accepted quantities, measured as provided in Subsection 109.02, will be paid at the contract price per unit of measurement for the Section 648 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

703 - Aggregate

701.03_ANF_2_10_2018

Add the following to Subsections:

703.18 Driving Surface Aggregate. All Driving Surface Aggregate (DSA) is to be derived from natural limestone formations. Stone is defined as rock that has been crushed; rock is defined as consolidated mineral material. For use in this program, both are restricted to that which has been mined or quarried from existing bedrock formations.

All components of the aggregate mix are to be derived from crushed parent rock material that meets program specifications for abrasion resistance, pH and freedom from contaminants. Ninety-eight percent (98%) of the fines passing the #200 sieve must be parent rock material. No clay or silt soil may be added. The amount of particles passing the #200 sieve shall be determined using the washing procedures specified in PTM No. 100.

Size: The required amount and allowed ranges, determined by weight, for various size particles are:

PASSING SIEVE	LOWER%	HIGH%
1 ½ inch	100%	
¾ inch	65%	90%
#4	30%	65%
#16	15%	30%
#200	10%	20%

LA Abrasion: The acceptable limit is measured by weight loss is “less than 40% loss”. Los Angeles Abrasion test, AASHTO T-96 (ASTM C 131) shall be used to determine this property. Existing tests made for and approved by PennDOT will be accepted.

Sulfate Test: Soundness or resistance to freeze/thaw (i.e. sulfate test) is not specified for this application because a gravel road driving surface aggregate is not bound within a concrete or asphalt mix.

pH: Aggregate must be within the range of pH 6 to pH 9 as measured by EPA 9045C.

Optimum Moisture: Material is to be delivered and placed at optimum moisture content as determined for the particular source. The optimum percentage moisture is to be identified by the supplier in the bid purchasing documents. Loads with excessive moisture shall be rejected. Water draining from the tailgate, excess material sticking to the roller drum or the inability to compact the material are field indicators of excess moisture. In addition, if a load is too dry or does not have enough fines it will be rejected. Visual inspection of the load and poorly

consolidated material after compactive effort are field indicators of low moisture or poor product gradation.

Transport: Tarps are to be used to cover 100% of the load's exposed surface from the time of loading until immediately before dumping. This requirement includes standing time waiting to dump.

Aggregate producers are required by the program to certify that the aggregate they deliver conforms to the program specifications. To eliminate segregation of material, stockpiling of material at jobsite will not be permitted unless authorized by COR.

The following are "Local" sources for this material:

Hawbaker – Turtlepoint, PA. 814-237-1444 or 814-642-2500/814-558-5654

New Enterprise Stone & Lime Co. – Central PA 814-766-2211 or 814-224-6865

IA Construction Corporation – Franklin, PA 814-432-3184

Allegheny Mineral Corporation, Glacial Sand & Gravel Company – Kittanning, PA 814-548-8101

Road Preparation Specifications: The road surface to receive the aggregate should have template with crown of 2% or ¼ inch per foot. The receiving surface is to be scarified to permit knitting of the aggregate.

Driving Surface Aggregate Placement: Minimum compacted depth of four inches is to be established for driving surface. Driving Surface Aggregate is to be applied by tailgate spreading unless spreader box is specified. Material when placed shall be compacted as follows: Beginning on the lower or berm side of the crown, begin rolling and work your way to the top of the crown by overlapping the successive longitudinal passes. Do not run the roller lengthwise directly on the crown. Compaction with truck tires is not accepted. Steel wheel rollers other than vibratory shall be capable of exerting a force of not less than 250 pounds per inch of width of the compression roller or rollers. Rollers shall be self propelled with a minimum weight of 6 tons. Contractor must have certification in writing that material placed is Driving Surface Aggregate meeting this specification.

703.19 1" Minus Aggregate (DSA Gravel non limestone): The required amount and allowed ranges, determined by weight, for various size particles are:

PASSING SIEVE	LOWER%	HIGH%	
1 ½ inch	100%		
¾ inch	65%	95%	
#4	30%	65%	LA Abrasion < 40%
#16	15%	30%	Sulfate Test – Not Applicable
#200	10%	15%	PH between 6 and 9

Material available at Glenn O. Hawbacker – Pittsfield Pit 814-563-7911

AI Construction Corporation – Gardland Plant 814-563-7680

703.20 Pennsylvania 2A Gradation:

The required amount and allowed ranges, determined by weight, for various size particles are:

PASSING SIEVE	LOWER%	HIGH%	
2 inch	100%		
¾ inch	52%	100%	
#4	24%	50%	LA Abrasion < 40%
#16	10%	30%	Sulfate Test – Not Applicable
#200	0%	10%	PH between 6 and 9

703.21 AASHTO 57 Gradation:

The required amount and allowed ranges, determined by weight, for various size particles are:

PASSING SIEVE	LOWER%	HIGH%
1-1/2 inch	100%	
1 inch	95%	100%
1/2 inch	25%	60%
#4	0%	10%
#8	0%	5%

703.22 4” Minus Aggregate:

The required amount and allowed ranges, determined by weight, for various size particles are:

PASSING SIEVE	LOWER%	HIGH%
4 inch	100%	
3 ½ inch	85%	95%
2 1/2 inch	75%	85%
1 1/2 inch	50%	70%
1 inch	40%	50%
3/4 inch	35%	45%
1/2 inch	25%	35%

703.23 4” Modified (-4 ¼” x 0) Aggregate:

The required amount and allowed ranges, determined by weight, for various size particles are:

PASSING SIEVE	LOWER%	HIGH%	
3 ½ inch	100%		
2 inch	80%	85%	
1 1/2 inch	75%	80%	
3/4 inch	60%	65%	
3/8 inch	45%	50%	
#4	30%	40%	128 to 131 lb. / cu.ft.

Material available at Glenn O. Hawbacker – Pittsfield Pit 814-563-7911

703.24 Crushed Pennsylvania 3A (AASHTO #3) Aggregate:

The required amount and allowed ranges, determined by weight, for various size particles are:

PASSING SIEVE	LOWER%	HIGH%
2 1/2 inch	100%	
2 inch	90%	100%
1 1/2 inch	35%	70%
1 inch	0%	15%
1/2 inch	0%	5%

703.25 Crushed Pennsylvania 3A Modified (AASHTO #3 Modified) Aggregate:

The required amount and allowed ranges, determined by weight, for various size particles are:

PASSING SIEVE	LOWER%	HIGH%
3 inch	100%	
2 inch	85%	100%
1 1/2 inch	70%	85%
3/4 inch	45%	70%
#4	35%	45%
#16	20%	35%

703.26 AASHTO #1 (4A) Aggregate:

The required amount and allowed ranges, determined by weight, for various size particles are:

PASSING SIEVE	LOWER%	HIGH%
4 inch	100%	
3 1/2 inch	90%	100%
2 1/2 inch	25%	60%
1 1/2 inch	0%	15%
3/4 inch	0%	5%

704 - Soil

704.01_ANF_02_28_2019

704.01. Foundation Fill.

Replace section (a) with the following:

(a) Maximum particle size	3 inches

704.01_Tongass Forest_11_3_2017

704.01. Foundation Fill.

Delete the subsection and replace with the following:

704.01 Foundation Fill. Furnish a suitable material conforming to the following:

(a) Material passing 6 inch sieve	100%
(b) Material passing 3 inch sieve	75%-100%
(c) Material passing No. 200 sieve	0-15%
(d) Maximum Plasticity Index	6

704.02_National_7_18_2017

Delete Subsection 704.02(a) and replace with the following:

704.02 Bedding Material.

(a) Maximum particle size	3 in (75 millimeters) or half the corrugation depth, whichever is smaller

704.03_Tongass Forest_11_3_2017

704.03 Backfill Material.

Delete the subsection and replace with the following:

704.03 Backfill Material. Furnish granular material or fine compactible soil free of excess moisture, muck, frozen lumps, roots, sod, and other deleterious material.

704.04 Structural Backfill.

Replace with the following:

Structural backfill shall be as specified in Section 704.03(a) unless otherwise specified by the arch/box culvert manufacturer.

704.04_Tongass Forest_11_3_2017

704.04 Structural Backfill.

Delete the subsection and replace with the following:

704.04 Structural Backfill. Furnish a suitable, free draining material. Remove all rock particles and hard earth clods larger than 9 inches in the longest dimension. Ensure material conforms with the following:

(a) Material passing No 200 sieve, AASHTO T 27 and T 11	5% max.
(b) Liquid limit, AASHTO T 89	30% max.

705 - Rock

705.02_ANF_02_18_2018

Replace 705.02 with the following:

705.02 Riprap Rock. Furnish rock sound, free from structural defects and foreign substances such as soil, shale, and organic materials. Use rock conforming to the following requirements:

No shale seams

Hard and angular shaped rock with neither width nor thickness less than one-third its length.

Minimum specific gravity of 2.5 as determined according to AASHTO T 85, bulk saturated, but surface-dry basis.

Each load of rock well-graded, from smallest to the largest size

Table 705-1
Gradation Requirements for Riprap

	Percent Passing (Square Openings)				
Class, Size No. Rock Size (inches)	R-7	R-6	R-5	R-4	R-3
30	100				
24		100			
18	15-50		100		
12	0-15	15-50		100	
9			15-50		
6		0-15		15-50	100
4			0-15		
3				0-15	15-50
2					0-15
Nominal Thickness	36	30	24	18	12