TECHNICAL SPECIFICATION 1510

EXCAVATION, OVER-EXCAVATION, BORROW, AND FILL

Revised 08/20/2025

1510.1 GENERAL

1510.1.1 Excavation, over-excavation, borrow, and fill shall consist of all earthwork operations involved in grading and construction in accordance with the plans and specifications, except for: Excavation and backfill for structures, Excavation and backfill for trenching, and any other earthwork operations separately designated.

1510.2 REFERENCES

This section incorporates the following publications by reference:

- ASTM D-1557
- ASTM D-422
- ASTM D-4318
- ASTM D-6938

This publication:

- NM APWA Section 201
- SSCAFCA 1513
- SSCAFCA 1514

1510.3 MATERIAL CLASSIFICATIONS

1510.3.1 UNSUITABLE MATERIAL

Unsuitable materials shall include all material that contains debris, roots, organic matter, stones or boulders too large to be used in the intended construction, or other materials that are determined by the Engineer to be unsuitable. Otherwise suitable materials, which are unsuitable due to excess moisture content, will not be classified as unsuitable material unless it cannot be dried by manipulation, aeration or blending with other materials satisfactorily as determined by the Engineer.

Material that is unsuitable for the intended use shall be excavated and removed from the site or otherwise disposed of as approved by the Engineer. Unsuitable material shall be disposed of in accordance with environmental requirements and as approved by the Project Manager.

1510.3.2 FILL MATERIAL

All fill material shall be free of vegetation and debris. Clods or hard lumps of earth of 6 inches in greatest dimension shall be broken up. Fill materials shall be free of vegetation and debris and contain no rocks larger than 3 inches. All fill and backfill material, including selection and blending of material, shall be subject to approval by the Engineer. All fill material shall conform to the requirements for Structural Fill as outlined below.

1510.3.3 STRUCTURAL FILL AND BACKFILL

Structural fill and backfill shall consist of material excavated from on-site or Borrow Material that meets the requirements described in this section. The blended excavated site soils from within the area will be generally suitable for use as structural fill. Blending of soils shall be considered incidental to the Work and no separate payment will be made for this effort. Gradation of the fill material, as determined in accordance with ASTM D-422, shall be as follows:

Sieve Size (Square Openings)	Percent Passing (by Weight)
3 inch	100
No. 4	60-100
No. 200	5-40

All structural fill shall be blended as necessary to produce a homogeneous material. The plasticity index of the structural fill shall be no greater than 15 when tested in accordance with ASTM D-4318.

1510.3.4 BORROW MATERIAL

Borrow material is defined as material obtained from an approved borrow source to be used as structural fill material for construction. If borrow material is required, the Contractor shall identify a borrow site and obtain soils tests to verify compliance of the material with structural fill requirements per this specification. The Contractor shall not import any borrow material prior to verification that material meets the requirements contained herein and he has received approval to import the material by the Owner.

1510.3.5 SURPLUS MATERIAL

The Contractor shall make all arrangements for disposal of surplus material in accordance with environmental requirements and as approved by the Project Manager. If the material is disposed of on-site, the Contractor shall place material in locations as designated by the Owner. Do not remove materials from the project limits without the approval of the Owner. The Contractor shall satisfy themselves that there is sufficient material available for the completion all items requiring fill material before disposing of any indicated surplus material inside or outside of the project area. Any shortage of material caused by premature disposal of surplus material by the Contractor shall be replaced by the Contractor and no payment will be made for such replacement.

1510.4 CONSTRUCTION REQUIREMENTS

1510.4.1 GENERAL

Contractor shall perform necessary clearing, grubbing and stripping in accordance with Section 201 of the Specifications and Supplemental Technical Specification 201, "Clearing and Grubbing", prior to any excavation, grading, or other earthwork operations. Excavation, fill construction and backfill shall be finished to reasonably smooth and uniform surfaces.

All slopes and cuts should be made in accordance with CFR 29 Part 1926 Subpart P, and all other applicable regulations.

1510.4.2 EXCAVATION

Excavation shall consist of the removal of earth involved in grading and construction according to the plans, except other excavations separately designated.

Temporary construction excavations shall be made in accordance with CFR 29 Part 1926 Subpart P, and all other applicable regulations. Surface water shall be routed such that it does not flow down the face of the excavation slopes. Where insufficient space exists for open cut excavations, a shoring system will be required. All required shoring systems shall be considered incidental to the cost of excavation and no additional payment will be made for this item. All excavations shall comply with all applicable safety regulations.

1510.4.3 OVER-EXCAVATION

Over-excavation shall consist of removal and replacement (backfill) of earth to the limits and depths provided in the plans. Backfill of over-excavated areas shall be in accordance with 1510.3.2.

1510.4.4 FILL CONSTRUCTION

Fill construction shall consist of constructing embankments, the placing and compacting of approved material within areas where unsuitable material has been removed; and the placing and compacting of suitable materials in holes, pits, and other depressions.

1510.4.5 PLACING AND COMPACTING

Fill or backfill, consisting of soil approved by the Engineer and/or recommended in the project's Geotechnical Report, should be placed in controlled compacted layers not exceeding 8 inches (compacted) with approved compaction equipment. All fill material should be blended as necessary to produce a homogeneous fill.

The fill should be raised uniformly and should be benched into the native soils. All compaction should be accomplished to a minimum of 95 percent of maximum dry density. No lifts of high permeability material or material differing substantially from the lift below shall be permitted.

At locations where it would be impractical to use mobile power compacting equipment, fill layers shall be compacted to the specified requirements by any approved method that will obtain the specified compaction.

1510.5 TESTING

1510.5.1 Tests for degree of compaction should be determined in accordance with ASTM D-1556 or ASTM D-6938.

1510.5.2 A compaction test is required on every lift or every 500 SY, whichever is less.

1510.5.3 Continuous, full time observation and field tests should be conducted during fill and backfill placement by a representative of the Engineer to assist the contractor in evaluating the required degree of compaction. If less than the required compaction is obtained, additional compaction effort should be made with adjustment of the moisture content as necessary until 95 percent compaction is obtained.

1510.6 MEASUREMENT AND PAYMENT

1510.6.1 UNSUITABLE MATERIAL

The removal and disposal of unsuitable material will be paid for as "Excavation, Removal, and Disposal of Unsuitable Material" for the quantities involved. This item will be created via Change Order, if the situation arises.

1510.6.2 EXCAVATION

Payment will be made on the unit price per cubic yard for "Unclassified Excavation" as provided in the Unit Price Bid Proposal. Payment will include the cost for all excavation, removal, storage and disposal of unsuitable material, hauling of surplus material to the designated location(s), hauling of select material within the construction site, placement, and compaction.

No payment will be made for excavation of stockpiled materials, structural excavation of previously placed materials and over depth (over-excavation) cuts. No payment will be made for shrink or swell. Excavation beyond the limits shown in the plans will not be included in measurement or payment.

1510.6.3 OVER-EXCAVATION

Payment will be made on the unit price per cubic yard for "Over-Excavation" as provided in the Unit Price Bid Proposal. Payment will include the cost for all excavation, removal, storage and disposal of unsuitable material, hauling of select material within the construction site, placement, and compaction.

No payment will be made for excavation of stockpiled materials. No payment will be made for shrink or swell. Excavation beyond the authorized over-excavation limits shown in the plans will not be included in measurement or payment.

1510.6.4 BORROW

Borrow material will be measured by the cubic yard in-place after compaction. Field topographic surveys, as described in SSCAFCA Technical Specification 1513 or 1514 "Construction Staking", will be used to determine in-place quantities.

Payment will be made on the unit price per cubic yard for "Borrow" as provided in the Unit Price Bid Proposal. Payment will include excavation & haul from Borrow Area, moisture conditioning, required blending of soils, placement, compaction, and other related work.

END OF SECTION

TECHNICAL SPECIFICATION 1513

CONSTRUCTION SURVEY & STAKING

Revised 08/20/2025

1513.1 DESCRIPTION

This work consists of construction survey and construction staking lines, grades, and layouts by the CONTRACTOR in accordance with the plans and specifications and as directed by the ENGINEER for the control and completion of the project.

1513.2 MATERIALS

CONTRACTOR shall furnish all stakes, templates, straightedges, surveying equipment and other devices necessary for establishing, checking, marking, and maintaining points, including P.I.'s, P.C.'s, P.T.'s, and lines, grades and layouts. As directed by the OWNER and/or ENGINEER, points shall be referenced so that they may later be re-established.

1513.3 CONSTRUCTION REQUIREMENTS

CONTRACTOR shall be responsible for all control, slope stakes, cut stakes, offset stakes, benchmarks, blue tops or other staking necessary for proper execution of the work, or as requested by the OWNER and/or ENGINEER, to assure compliance with the plans. The OWNER and/or ENGINEER may request additional survey information at their discretion.

1513.4 CONSTRUCTION SURVEYS

CONTRACTOR shall obtain and pay for the services of a Professional Surveyor licensed in the State of New Mexico to perform surveys consisting of the following phases:

1513.4.1 *Phase 1 EG Survey*: A topographic survey, with a contour resolution of 1-foot or less, to accurately reflect the Project Site existing ground (EG) elevations. Unless otherwise directed by the OWNER and/or ENGINEER, Phase 1 Survey shall **not** occur before Clear & Grub and Removals bid items are completed. Phase 1 Survey shall include Borrow Area, if applicable.

Phase 1 Survey shall include development of an EG digital terrain model (DTM) of the Project Site, which will be used to determine earthwork quantities to be paid to CONTRACTOR. The Phase 1 Survey DTM shall be submitted to the ENGINEER for review and written acceptance prior to proceeding with any earthwork.

1513.4.2 *Phase 2 FG Survey:* An as-built topographic survey, with a contour resolution of 1-foot or less, to accurately reflect the Project Site finished ground (FG) elevations and to determine final earthwork quantities to be paid to CONTRACTOR. Phase 2 Survey shall include Borrow Area, if applicable.

Phase 2 survey shall have sufficient detail to demonstrate compliance with the design grades, structure elevations, inverts, alignments/profiles, etc. shown on the construction plans. It is the responsibility of the CONTRACTOR to coordinate with the surveyor on a regular basis to provide as-built information to incorporate in the Phase 2 survey, especially for project elements that will be buried in the FG condition.

Phase 2 survey shall be stamped, signed, and certified by a Licensed Professional Surveyor and provided in pdf format.

Phase 2 Survey also includes development of an FG DTM of the Project Site. The Phase 2 Survey DTM shall be submitted to the ENGINEER for review and written acceptance prior to final Pay Application. Earthwork volumes shall not include surfacing treatments such as rock, riprap, concrete, etc. Earthwork volume computations shall be performed by the surveyor based on the "average end area" computation.

Phase 2 Survey shall be such that methods and computations can be fully verified and are subject to approval by the OWNER and/or ENGINEER. The OWNER and/or ENGINEER may request additional survey information at their discretion.

1513.5 METHOD OF MEASUREMENT

Submit a construction-staking schedule of values as part of each Pay Application to the Project Manager for approval.

1513.6 BASIS OF PAYMENT

SSCAFCA will make partial payments in accordance with the approved construction-staking schedule of values.

Pay Item	Pay Unit
Construction Staking	Lump Sum

END OF SECTION

SECTION 201

CLEARING AND GRUBBING

201.1 GENERAL

This work shall consist of removing natural and man-made objectionable material from the right-of-way, construction areas, road approaches, material and borrow sites, areas through which ditches and channels are to be excavated, and such other areas as may be shown on the plans. Clearing and grubbing shall be performed in advance of grading operations except that in cuts over 3 feet in depth, grubbing may be done simultaneously with excavation, provided stumps, roots, embedded wood, foundations and slabs are removed as specified. Clearing and grubbing shall be in accordance with the requirements herein specified, such as erosion control requirements. Demolition of structures, other than foundations or slabs, shall be as shown on the plans.

201.2 REFERENCES

201.3 PRESERVATION OF PROPERTY

Existing improvements, adjacent property, utility and other facilities, and trees and plants not to be removed shall be protected from injury or damage resulting from the CONTRACTOR's operations. Only trees and plants designated or marked for removal by the ENGINEER shall be removed.

201.4 CONSTRUCTION METHODS

201.4.1 The natural ground surface shall be cleared of vegetable growth, such as trees, tree stumps, logs, roots or downed trees, brush, grass, weeds, and surface boulders, as well as fences, walls, rubbish, foundations and slabs.

201.4.2 Unless otherwise shown on the plans, the entire area of the project within the limit lines specified below shall be cleared and grubbed. No payment will be made to the CONTRACTOR for clearing and grubbing outside these limits, unless such work is authorized by the ENGINEER.

201.5 LIMIT LINES: Except when limit lines for clearing and grubbing are shown on the plans or are staked by the ENGINEER, clearing and grubbing shall extend only within reasonable limits of the work area.

201.6 REMOVAL OF TREES AND TREE BRANCHES

201.6.1 Trees shall be removed in such a manner as not to injure standing trees, plants, and improvements which are to remain. Tree branches extending over a roadway and which clear finish grade by 12 feet or less shall be cut off close to the boles in a workmanlike manner.

201.6.2 Trees requiring trimming to facilitate normal construction operations shall be trimmed by a tree surgeon.

201.7 REMOVAL AND DISPOSAL OF DEBRIS

Debris to be removed shall be disposed of outside the right-of-way at a location satisfactory to the ENGINEER, except when burning of combustible debris is permitted. The area to be graded and adjacent areas shall be left with a neat and finished appearance. No accumulation of flammable material shall remain on or adjacent to the property line. In case burning precedes construction operations, the piles may be placed in the center of the area; otherwise, the piles shall be placed in the most convenient location at the side of the area and beyond slope lines where they may be burned without damage to surrounding forest cover or adjacent property. Burning shall be done in conformance with local regulations and at such times and in such manner as to prevent the fire from spreading to areas adjoining the construction site. In areas where burning is prohibited by local regulations, all removed material shall be disposed in an approved solid waste disposal site.

201.8 REMOVAL AND DISPOSAL OF SALVAGEABLE ITEMS

Items and materials of salvage value as shown on the plans or as determined by the ENGINEER, unless incorporated in the new work, shall remain the property of the OWNER and shall be delivered to approved storage areas as directed by the ENGINEER. Such items and materials shall be carefully removed and delivered in such a manner as to permit re-use.

201.9 MEASUREMENT AND PAYMENT

201.9.1 CLEARING AND GRUBBING:

201.9.1.1 When the proposal includes an item for clearing and grubbing, the quantity for measurement shall be as indicated in the Bid Proposal.

201.9.1.2 The unit price per acre paid for clearing and grubbing shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in clearing and grubbing as shown on the plans, as provided in these specifications and as directed by

the ENGINEER, including the removal and disposal of resulting material.

201.9.1.3 When the Bid Proposal does not include a pay item for clearing and grubbing as above specified and unless otherwise specified in the Supplementary Specifications, full compensation for any necessary clearing and grubbing required to perform construction operations specified shall be considered as included in the price paid for other items of work and no additional compensation will be allowed therefore.

201.9.2 REMOVAL AND DISPOSAL OF TREES: If the Bid Proposal includes separate estimates of quantities for the removal of trees, the trees shall be classified by size as follows:

201.9.2.1 Trees less than 12 inches in circumference at 3 feet above the original ground surface shall be considered as included in the price for clearing and grubbing or excavation, and no additional compensation will be allowed therefor.

201.9.2.2 Trees between 12 and 30 inches in circumference shall be measured as a unit price for each tree in the item provided in the Bid Proposal for trees of this dimension.

201.9.2.3 Trees more than 30 inches in circumference shall be measured as a unit price for each tree in the item provided in the Bid Proposal for trees of this dimension.

SUPPLEMENTAL TECHNICAL SPECIFICATION

APWA (2006) SECTION 201

CLEARING AND GRUBBING

Revised 07/24/2020

1. In the Subsection 201.1 GENERAL, delete the second sentence and replace with the following: Clearing and grubbing shall be performed in advance of the grading operations.

2. In the Subsection 201.4.1 CONSTRUCTION METHODS, add the following:

   Clearing and grubbing operations shall include stripping of the existing ground surface. Stripping shall be achieved only by cutting, i.e., ground depressions or narrow sections of tributary arroyos should not be inadvertently filled during the foundation preparation. The resulting area shall be cut to provide a uniform, relatively level surface.

3. In Subsection 201.5 LIMIT LINES, add the following:

Unless otherwise approved by the Engineer or otherwise specifically designated on the plans, limits of clearing & grubbing shall not exceed slope limits as shown with finished grade contours on plans.

END OF SECTION