

PART 1 – GENERAL

1.1 RELATED SECTIONS

- A. Section 31 20 00 - Earth Moving
- B. Section 31 05 16 - Geotextiles
- C. Section 31 00 00 - Site Clearing
- D. Section 32 11 23 - Aggregate Base Courses
- E. Section 31 25 00 - Erosion and Sediment Control
- F. Section 31 23 16 - Excavation and Backfill for Utility Trenches
- G. Section 31 23 23 - Structural Fill
- H. Section 01 33 00 - Submittal Procedures
- I. Section 01 45 00 - Quality Control
- J. Section 01 74 19 - Construction Waste Management and Disposal

1.2 APPLICABLE REFERENCES, STANDARDS, AND CODES

- A. American Society for Testing and Materials (ASTM)
 - a) ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort
 - b) ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
 - c) ASTM D2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
 - d) ASTM D2216 - Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
 - e) ASTM D4253 - Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
 - f) ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
 - g) ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- B. Occupational Safety and Health Administration (OSHA)
 - a) OSHA 29 CFR Part 1926 - Safety and Health Regulations for Construction
- C. American Association of State Highway and Transportation Officials (AASHTO)
 - 1. AASHTO T99 - Moisture-Density Relations of Soils Using a 5.5-lb Rammer and a 12-in. Drop
 - 2. AASHTO T180 - Moisture-Density Relations of Soils Using a 10-lb Rammer and an 18-in. Drop
- D. International Building Code (IBC)
- E. Local Building Codes and Regulations

1.3 QUALITY ASSURANCE

A. Qualifications

1. Excavation and fill work shall be performed by a firm experienced in excavation and fill operations of similar scope and complexity.
2. Provide qualifications of personnel and equipment upon request.

B. Testing and Inspection

1. Engage a qualified geotechnical testing laboratory to perform soil classification, moisture content, density, and compaction testing.
2. Testing frequency shall comply with project requirements and applicable standards or as directed by the Engineer.
3. Field density tests shall be performed at a minimum frequency of one test per 500 square yards per lift or as specified.

C. Compliance

1. All excavation and fill operations shall comply with OSHA safety regulations for excavation and trenching.
2. Verify utility locations prior to excavation.
3. Maintain alignment, grades, and elevations within tolerances specified by the Engineer.

1.4 SUBMITTALS

A. Action Submittals

1. Excavation and Fill Plan including sequence, methods, equipment, and temporary support measures.
2. Material submittals for fill material including source, gradation, and test reports.
3. Equipment list proposed for excavation, hauling, and compaction.
4. Quality control plan including testing frequency and methods.
5. Manufacturer's data for geotextiles or additives incorporated in fill materials.

B. Informational Submittals

1. Soil test reports including classification, moisture content, and compaction characteristics.
2. Records of field density and moisture tests.
3. Reports of non-conformance and corrective actions.
4. Project schedule updates related to excavation and fill operations.
5. Health and safety plan related to excavation activities.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery

- a) Deliver fill materials in a manner to prevent contamination and segregation.

B. Storage

1. Store fill materials on-site in designated areas to prevent mixing with foreign materials.
 2. Protect stockpiles from erosion and contamination by water, debris, and other materials.
- C. Handling
1. Handle fill materials to avoid segregation and contamination.
 2. Maintain moisture content of fill materials within limits required for proper compaction.

1.6 WARRANTIES

- A. Provide a warranty for fill compaction and stability for a period of one year from date of final acceptance.
- B. Warranty shall cover settlement, erosion, and compaction failure requiring remedial action.
- C. Submit warranty documentation signed by Contractor and geotechnical engineer or testing agency.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Excavation Materials
 1. Remove unsuitable materials including organic matter, debris, frozen soil, and unstable soils as directed.
- B. Fill Materials
 1. Granular Fill: Clean, well-graded sand, gravel, or crushed stone free of organic material and deleterious substances.
 2. Structural Fill: Engineered fill meeting project gradation and compaction requirements per geotechnical recommendations.
 3. Select Fill: Free from rocks larger than 2 inches, debris, and foreign matter, with plasticity index less than 15.
- C. Geotextiles and Additives
 1. Provide geotextiles for separation or stabilization as specified and per Section 31 05 16.
 2. Additives such as lime or cement for soil stabilization shall comply with project specifications and standards.

2.2 MANUFACTURERS

- A. Fill Material Suppliers
 1. Lehigh Hanson Inc.
 2. Vulcan Materials Company

3. Martin Marietta Materials
4. CEMEX Inc.
- B. Geotextile Manufacturers
 1. TenCate Geosynthetics
 2. Huesker Inc.
 3. Mirafi (Part of TenCate)
- C. Testing and Inspection Agencies
 1. Local certified geotechnical laboratories approved by the Engineer.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify site conditions and limits of excavation prior to starting work.
- B. Confirm that utilities have been located and protected or removed as necessary.
- C. Notify Engineer of any discrepancies, unsuitable soil conditions, or obstructions.

3.2 PREPARATION

- A. Clear and grub excavation areas of vegetation, debris, and unsuitable materials.
- B. Strip topsoil and stockpile separately for reuse or disposal.
- C. Provide erosion and sediment control measures as specified.

3.3 EXCAVATION

- A. Excavate to lines, grades, and elevations indicated on drawings or as directed.
- B. Remove unsuitable or unstable materials to the depth directed.
- C. Perform excavation using equipment suitable to maintain accuracy and minimize disturbance.
- D. Maintain excavation slopes and shoring in compliance with OSHA requirements.
- E. Remove water from excavations to maintain dry working conditions.

3.4 FILLING AND BACKFILLING

- A. Place fill materials in layers not exceeding 8 inches loose thickness.
- B. Maintain moisture content of fill material within optimum range for compaction.
- C. Compact each layer to not less than 95 percent of maximum dry density per ASTM D698 or project-specific criteria.
- D. Use mechanical compaction equipment suitable for soil type and layer thickness.
- E. Scarify existing surfaces to receive new fill to promote bonding.
- F. Do not place fill on frozen or muddy surfaces.

3.5 FIELD QUALITY CONTROL

A. Testing

1. Perform field density tests using sand cone, nuclear gauge, or other approved methods.
2. Test frequency: minimum one test per 500 square yards per lift or as directed.
3. Perform moisture content tests in conjunction with density tests.

B. Corrective Measures

1. Remove and replace or re-compact areas failing to meet compaction requirements.
2. Document all corrective actions and retesting.

3.6 PROTECTION

- A. Protect completed fill from erosion, disturbance, and damage.
- B. Maintain drainage to prevent water accumulation on fill areas.
- C. settlement, erosion, or damage at no cost to the Owner during warranty period.

3.7 CLEANING

- A. Remove excess materials, debris, and equipment from site upon completion.
- B. Restore adjacent areas disturbed by excavation and fill operations.

END OF SECTION 31 23 00

BUILDING FOR ROGERS FACILITIES DEPARTMENT
ROGERS, AR

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DEMX ARCHITECTURE
FAYETTEVILLE, AR