SECTION 02230 - SITE CLEARING

1.1 General

A. Materials Ownership: Except for materials indicated to be stockpiled or to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from the site.

B. Traffic: Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.

1.2 Products

A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 2 Section "Earthwork."

1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

1.3 Execution

A. Locate and clearly flag trees and vegetation to remain or to be relocated.

B. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

C. Erect and maintain a temporary fence around drip line of individual trees or around perimeter drip line of groups of trees to remain. Remove fence when construction is complete.

1. Where excavation for new construction is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

D. Do not excavate within drip line of trees, unless otherwise indicated.

E. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Architect.

F. Utilities: Locate, identify, disconnect, and seal or cap off utilities indicated to be removed. Do not interrupt utilities serving facilities occupied by Owner or others unless permitted. Arrange to provide temporary utility services.

1. Excavate for and remove underground utilities indicated to be removed.

G. Clearing and Grubbing: Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots.

1. Fill depressions with satisfactory soil material. Place fill material in horizontal layers not exceeding 8-inch (200-mm) loose depth, and compact each layer to a density equal to adjacent original ground.

H. Topsoil Stripping: Remove sod and grass before stripping topsoil. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.

I. Site Improvements: Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.

J. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off Owner's property.

END OF SECTION 02230

SECTION 02300 - EARTHWORK

1.1 General

A. Definitions in this Section include the following:

1. Backfill: Soil materials used to fill an excavation.
2. Base Course: Layer placed between the subbase course and asphalt paving.
3. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.
4. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.
5. Drainage Course: Layer supporting slab-on-grade used to minimize capillary flow of pore water.
6. Excavation: Removal of material encountered above subgrade elevations.

    a. Additional Excavation: Excavation below subgrade elevations as directed by Architect. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
    b. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

7. Fill: Soil materials used to raise existing grades.
8. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
9. Subbase Course: Layer placed between the subgrade and base course for asphalt paving, or layer placed between the subgrade and a concrete pavement or walk.
10. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
11. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

B. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated.

1.2 Products

A. Soil Materials: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM, or a combination of these group symbols; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT, or a combination of these group symbols.

D. Backfill and Fill: Satisfactory soil materials.

E. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (38-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.

F. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

G. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch (38-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.

H. Detectable Warning Tape: Polyethylene film warning tape encasing a metallic core, minimum 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility.

1.3 Execution

A. Preparation: Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Provide erosion- and sedimentation-control measures.

C. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

D. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

E. Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

F. Excavate for structures, pavements, and walks to indicated elevations and dimensions. Extend excavations for placing and removing concrete formwork, for installing services and other construction, and for inspections. Trim bottoms to required lines and grades to leave solid base to receive other work.

G. Excavate utility trenches to indicated gradients, lines, depths, and invert elevations of uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit.

1. Excavate trenches deeper than bottom of pipe elevation, 6 inches (150 mm) deeper in rock, 4 inches (100 mm) deeper elsewhere, to allow for bedding course. Hand excavate for bell of pipe.

H. Proof roll subgrades, before filling or placing aggregate courses, with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated subgrades.

I. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities.

J. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by Architect.

1. Fill unauthorized excavations under other construction or utility pipe as directed by Architect.

K. Stockpile borrow materials and satisfactory soil materials, without intermixing, in shaped, graded, drained, and covered stockpiles. Stockpile soil materials away from edge of excavations and outside drip line of remaining trees.

L. Utility Trench Backfill: Place, compact, and shape bedding course to provide continuous support for pipes and conduits over rock and other unyielding bearing surfaces and to fill unauthorized excavations.

1. Place and compact initial backfill of satisfactory soil material or subbase material, free of particles larger than 1 inch (25 mm), to a height of 12 inches (300 mm) over the utility pipe or conduit. Place and compact final backfill of satisfactory soil material to final subgrade.
2. Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

M. Fill: Place and compact fill material in layers to required elevations.

N. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

1. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

O. Compaction: Place backfill and fill materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.

P. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 92 percent.
3. Under lawn or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 85 percent.

Q. Grading: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated. Grade lawns, walks, and unpaved subgrades to tolerances of plus or minus 1 inch (25 mm) and pavements and areas within building lines to plus or minus 1/2 inch (13 mm).

R. Subbase and Base Courses: Under pavements and walks, place subbase course on prepared subgrade. Place base course material over subbase. Compact to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

S. Under slabs-on-grade, place drainage course on prepared subgrade. Compact to required cross sections and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

T. Testing Agency: Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.

1. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
2. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

U. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction.

V. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

W. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION 02300

SECTION 02511 - HOT-MIXED ASPHALT PAVING

1.1 General

A. Weather Limitations: Do not apply prime and tack coats when temperature is below 50 deg F (10 deg C) or when base is wet. Apply hot-mixed asphalt paving only when temperature is above 40 deg F (4 deg C) and when base is dry.

B. Standards: Colorado D.O.T. Standard Specifications, latest edition.

1.2 Products:

A. Materials: Use locally available materials and aggregate gradations that exhibit a satisfactory record of previous installations and as follows:

1. Soil Sterilization: 20 pounds polyborchlorate per 1,000 square feet of surface, mixed with water and applied with power spray after grading is completed.
2. Asphalt cement: ASTM D 338 for viscosity-graded material and ASTM D 946 for penetration-graded materials.
3. Mineral filler: ASTM D 242.
4. Base Course: 4" crushed rock over a properly prepared subgrade.
5. Pavement: 2" compacted Class "B" mix.

1.3 Execution:

A. Within 24 hours prior to asphalt paving, soil residual herbicide shall be applied to all crushed surfacing top course areas. Soil residual herbicide and its application shall conform to section 5-04.3(5)d of the W.S.D.O.T. Specifications.

B. Surface Preparation: Remove loose material from compacted subbase before applying prime coat. Do not begin paving work until unsatisfactory subbase conditions have been corrected.

c. Class B asphalt shall be placed within the parking lot areas as identified on the plans, and shall conform to the requirements of section 5-04 of the W.S.D.O.T. Specifications. Class B asphalt shall be mechanically compacted to a minimum of 92 percent of the rice density.

D. Cracks and porous conditions that result in the finish surface of the asphalt areas shall be sealed according to the requirements of crack sealing, section 5-04.3(5)c of the W.S.D.O.T. Specifications.

E. Provide joints between old and new pavements and between successive days work for continuous bond between adjoining work. Clean contact surfaces and apply tack coat.

F. Construct curbs over compacted pavement surfaces to cross-section shown or, if not shown, to local standard shapes.

G. Rolling: Begin rolling when mixture will bear roller weight without displacement. Repair surface defects with hot material as rolling progresses. Cut out and patch defective areas and roll to blend with adjacent satisfactory paving. Continue rolling until maximum density attained and roller marks eliminated.

H. Protect paving from damage and vehicular traffic until mixture has cooled and attained its maximum degree of hardness.

I. Paving Tolerances: In-place, compacted, hot-mixed asphalt paving will not be acceptable if exceeding the following tolerances:

1. Thickness of base course: Not more than plus or minus 1/2 inch.
2. Thickness of surface course: Not more than plus or minus 1/4 inch.
3. Base course surface smoothness: Not more than 1/4 inch when measured with a 10-foot straightedge.
4. Wearing course surface smoothness: Not more than 3/16 inch when measured with a 10-foot straightedge.

J. Traffic and Lane Markings: Apply two coats of alkyd type traffic-lane marking paint over cleaned paving surface. Lay out area and review with Architect before paint application. Use white unless otherwise directed.

1. Handicapped symbols conforming to the requirements of section 8-22 and the American Disabilities Act. Paint application shall conform to section 8-22.3(3).
2. At the head end of each handicapped stall, a "reserved parking" sign, R7-18, 12-inch by 18-inch shall be installed. The signs shall identify "state disabled parking permit required". One of the handicapped parking stalls south of the building shall also be labeled as "van accessible" which shall be attached to the "reserved parking" sign.
3. "Fire lane no parking" lettering shall conform the section 8-22 of the standard specification and shall be painted white.
4. Directional Arrows.

K. Wheel Stops: Install 8'-0" x 5" high precast concrete wheel stops use 2 drip pins per wheel stop.

END OF SECTION 02511