

DIVISION 2 - SITEWORK

SECTION 02150 - EXCAVATION & GRADING FOR BUILDING CONSTRUCTION

02150.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", the "Contract Forms", and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

02150.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the execution of excavation and grading for building construction and improvements, complete, in strict accordance with the Contract Drawings and as herein specified and required by conditions at the site.
  - a. General site excavation and grading for building construction. Excavation, backfilling and grading generally to a point for a distance of not less than 5 feet around the entire perimeter of the building construction to a level of 6" below finished grades in accordance with the contours and elevations and grading contract limits shown on the Drawings.
  - b. Clearing and grubbing and removal of unwanted material.
  - c. Removal of all trees (except where noted to remain) including stumps and roots.
  - d. Porous fill.
  - e. Temporary shoring, bracing, sheet piling, etc. as required for construction of new facility; without exception including shoring and/or underpinning of existing building.
  - f. Disposal of rubbish and objectionable excavated materials. Excavation and demolition and removal of existing material of every name and nature which may be required for the installation of work under this contract unless otherwise noted on drawings and specifications.
  - g. Temporary protection barricades, enclosure, etc., required by Local Authorities including complete fence enclosure of site as directed by Architect.
  - h. Subgrade preparation.
  - i. Finish grading.

- j. Storm drainage systems including curb inlets and trench drains.
- k. Trench excavation for all General Construction site work, trenching for underground utilities will be by respective prime contractor.
- l. Bituminous (asphalt) paving for driveways and parking and roads including striping.
- m. Topsoil and lawns.
- n. Spare conduits to be installed 18" min. below grade under apron and driveways and between building where indicated.

02150.0300 RELATED WORK SPECIFIED ELSEWHERE

Division 3 Concrete

02150.0400 INSPECTION OF SITE

- 1. Before submitting bid, visit the site and check all existing conditions. If, in the opinion of the Bidder and conditions exist which might effect the completion of the work as planned, he shall report them in writing to the Architect before submitting his bid. No consideration will be given to claims made because of possible existing adverse conditions not mentioned in these specifications.

02150.0500 SUBSURFACE CONDITIONS

- 1. Subsurface conditions have been investigated and information is shown on site plan. Borings were performed by Soil Mechanics. Additional borings shall be issued via addendum.
- 2. Data and information thereby obtained and conveyed is not guaranteed to be accurate for entire site by the Owner, Architect or any of its agents or Contractors.
- 3. Such data and information is offered in good faith for purpose of placing Contractor in receipt of all information available to Architect. Although reasonable care was used in determination of this data and information, there is no warranty, express or implied as to accuracy of such data and information and Architect and the Owner assume no liability for any inaccuracies; Contractor alone shall assume responsibility for any conditions which may in fact exist and which are not reflected in data and information. Contractor must interpret such data and information according to his own judgment and acknowledge that he is not relying upon same as accurately describing conditions which may be found to exist.

4. Contractor further acknowledges that he assumes all risks contingent upon nature of subsurface conditions to be actually encountered by him in performing work covered by his contract, even though such actual conditions may result in his performing more or less work than originally anticipated. It shall be further understood that actual excavation shall be unclassified, that Contractor is responsible for all materials encountered during excavation and that the Contractor shall report any unsatisfactory conditions and perform any additional excavation required at no additional cost to Owner.

#### 02150.0600 COOPERATION

1. Properly coordinate the work of this Section with work of contiguous trades and/or Contracts.

#### 02150.0700 PROTECTION

1. Execute the work in such manner that no damage or injury shall occur to persons, existing curbs, roads and walks, and any and all other property. Any damage or injury resulting from work under this Division shall be the responsibility of the Contractor, who shall make good such damage and assume all responsibility for such injury, without additional cost to the Owner. Notify all individuals, municipal agencies and service utility companies having jurisdiction over any affected above surface or subsurface utilities and protect or remove and/or relocate these services as required in accordance with their requirements.
2. Trees:
  - a. All trees in building construction area (except for those noted to remain) are to be removed. Existing trees to remain shall be protected by using boxing, guys, burlap around trees, and the like all as directed.
  - b. The Architect shall be notified of any situation in which trees or shrubs will hinder the construction operation. The Architect will decide the necessary action to be taken in such a situation.
3. Temporarily support and maintain the sides of excavations until permanent support is provided. Shore and brace all work, wherever required to prevent injurious caving or sliding, and to protect existing work. Provide sheet piling, adequately braced, where other means are insufficient to maintain excavations in stable conditions. Install work so as not to interfere with the proper placing and compacting of backfill. Remove all temporary work as the work progresses and necessity for same ceases to exist.

02150.0800 CLEARING AND GRUBBING

1. General: Under this item, the Contractor shall clear and grub the entire area within the limits of the work of this contract and remove all structures to the extent shown or as determined by the Architect.
2. Clearing and grubbing shall consist of the removal or destruction of trees, roots, stumps, bushes, and decayed or growing organic matter above and below the surface of the ground.
3. The Contractor shall use every precaution to prevent injury to roads, curbs, walks, pipes, conduits, poles and other structures above and below ground that are adjoining or included in the area under contract, and shall repair or replace at his own expense any material or work damaged or destroyed by his forces, while clearing the site.
4. The Contractor shall see that stock piles of materials and storage of equipment are in cleared spaces. He shall prevent his employees from tramping through existing plantings except when it is necessary in carrying out the work. He shall prevent equipment from being taken through existing planting.
5. No burning at the site will be permitted. Contractor shall assume that it will be necessary to remove all cleared material to public disposal areas and that on site burning will not be permitted.
6. Material removed under this item, unless otherwise specified or noted on the drawings, shall become the property of the Contractor and shall be legally disposed of.
7. All areas outside the site which are found necessary for the disposal of materials removed under this item shall be acquired by the Contractor at his own expense.

02150.0900 LINES AND GRADES

1. Establish and maintain all lines and grades for the work with required batter boards and elevation points.
2. A competent Engineer shall be employed by the Contractor to establish all lines and grades. Should the services of a licensed land surveyor be required, he shall be retained and paid for by the Contractor.
3. Prior to any construction, notify the Architect should any discrepancy occur.

4. Removal of Existing Topsoil:

- a. All topsoil in areas of operations shall be carefully scraped off and piled independent of the other excavated material in areas designated by the Architect/Owner. This topsoil shall be reused for grading at the completion of the work. If it is not needed, it shall remain the property of the Owner.
- b. Stock piles shall be such shape and size as will keep loss of topsoil by wind and erosion to a minimum and shall be trimmed in a workmanlike manner to fairly uniform surfaces and slopes. They shall be placed on clear and well drained lands, in areas designated by the Architect. The equipment, methods and workmanship shall be such as to avoid lifting of subsoil, or other unsuitable material. Topsoil operations shall not be carried on during unsuitable weather or when the topsoil is wet or frozen. The decision of the Architect shall be final in the matter.

5. Drainage: Conduct operations so as to prevent the accumulation of surface water in the vicinity of excavated and graded areas and provide all necessary ditches as required. Any water which accumulates in excavations shall be promptly remedied by pumping or other effective means.

02150.1000 GENERAL EXCAVATION

1. Include the satisfactory removal of all materials of every nature and description which are encountered in obtaining the lines, grades and elevations shown on the drawings. Suitable materials from the excavation shall be utilized for filling. Excavated materials which, in the opinion of the Architect, are not suitable for fill or embankment and excess materials (excluding topsoil) not needed for filling shall be removed and legally disposed of outside the site.

02150.1100 TRENCH EXCAVATION

1. Trenches shall be open cuts of the necessary width, to the correct alignment, for the proper installation of underground lines, with banks as nearly vertical as possible. Provide sheeting and/or shoring as may be necessary to protect life and the excavation it. Width of excavation at the bottom shall not exceed 20" plus the external diameter of the pipe, equally divided on each side of the pipe.
2. Bottom of trench shall be accurately graded and shaped to provide uniform bearing and support for the bottom quadrant of the pipe barrel on undisturbed soil at every point along its entire length. Excavation shall not be completely plowed, scraped or dug by machinery to finished grade. The last several inches shall be trimmed by hand to exact line and grade and shaped to support the pipe just prior to placing the pipe. In the event excavation is carried too deep in error, refill trench with suitable material

compacted properly in accordance with other portions of this Section and excavate to proper elevation by hand. Ample provision shall be allowed for making up joints.

3. Trenches shall not be opened farther in advance of the pipe laying than is necessary. No pipe laying in wet trench will be permitted. Excavation must be kept free from water. In accordance with other portions of this Division, backfill and compact.

#### 02150.1200 BUILDING EXCAVATION, FILLING AND BACKFILLING

##### 1. Excavation:

- a. Excavation shall be carried to elevations, depths and dimensions indicated. The footing elevations noted are intended to carry all bearings to the same strata of earth. No extra compensation will be allowed for any additional excavation required to insure uniform quality of bearing. All bearings shall be on undisturbed earth. If excavations for walls or footings are carried too deep by error, they shall be backfilled, but shall be brought to proper elevation with concrete mixed and placed as specified under Division 3 - CONCRETE, at no additional cost to the Owner. Minimum bearing soil shall be one and one half (1 1/2) tons per sq. ft. Remove materials of every nature and description encountered in obtaining indicated lines and grades.
- b. Excavate outside of building walls and foundations, etc., not less than one foot and more if necessary to allow for inspection work.
- c. Bottom of all excavations shall be leveled or otherwise properly trimmed to lines and grades as required.
- d. Slabs on grade shall be placed upon approved (by the Architect) compact granular fill, except as otherwise specified or shown on the drawings.
  1. Where natural subsoil directly under slabs on grade is of clay or silt, excavate to 6" below bottom of slab and backfill with compacted gravel. This does not exclude the placing of compacted gravel to a greater depth where shown on the drawings and/or herein specified.
- e. As the basis of the Contract, it shall be assumed that the material to be excavated is earth.
- f. Provide and operate all pumps, hose and drainage lines required to keep excavations free from water at all times, until after concrete has been placed for all footings and foundation walls. In the event that overtime labor is necessary to preform this work, it shall be done without additional cost to the Owner.

2. Filling and Backfilling:

- a. Promptly backfill excavations as work permits, but not before concrete walls and footings have attained adequate strength (min. 60% design) and piping and other items below backfill have been tested and approved.
- b. For backfilling, use earth free from waste, objectionable matter, loan, wood rubbish, debris or stones other 1/2 cubic foot. Do not use frozen material. Objectionable backfilling material shall be legally disposed of away from the site.
  1. All excess excavation not required as backfill for work under this Contract shall be removed and legally disposed of outside the site.
- c. Backfill and fill to new surface grades as required. If sufficient sound and approved fill materials are not on hand to complete filling operations to required grades, provide same at no extra cost to the Owner.
- d. Backfill around building walls, and under any slabs on grade, shall be with compacted clean sand and gravel.
- e. All filling and backfilling shall be deposited in layers: Each layer to be compacted to not less than 95% of the maximum density obtained at optimum moisture contents as determined by AASHTO T-180, Method "D". Final compaction tests must indicate a minimum of 95% compaction for the total fill.
- f. All rough grading shall be brought up to grades, required as shown on Site Plan. Unless otherwise indicated, the following depths shall be allowed for finished grading:
  1. Concrete Walls      5 Inches
  2. Bituminous Paving As Required by Drawings
  3. Grass Areas          6 Inches
  4. Other Areas          As Required by Drawings
- g. Compaction shall be by Contractor using mechanical tampers.

02150.1300 SUBGRADE PREPARATION

1. Subgrades shall be shaped to the required line, grade, and cross-section, and shall be rolled with approved equipment until thoroughly compacted. In paved areas, the full depth of subgrade in fill areas and the top 6" of the subgrade in cut areas shall be compacted to not less than 95% of the maximum density obtained at optimum moisture content as determined by AASHTO-T-180, Method "D". In other areas, compact to not less than 90%. All soft or otherwise unsuitable subgrade material shall

be removed and replaced with suitable materials as directed by the Architect. Low areas, holes, and depressions shall be brought to the required grade with approved material thoroughly compacted as herein provided. All roadway and parking area paving shall be installed on a subbase of a mixture of sand, gravel or other acceptable material compacted as described above for paved areas.

#### 02150.1400 POROUS FILL

1. Stone or gravel: Pass through a 2" ring and be retained by a 1" mesh.
2. The subgrade below fill shall be brought to a true and even plane and compacted to a solid bearing. Porous fill shall be installed to a minimum compacted depth of 6" and leveled to a reasonably true and even surface. All piping, etc., installed below porous fill shall have been tested and approved before installation of fill. After placing porous fill, stones larger than 3" in any dimension shall be hand removed or broken up.

#### 02150.1500 FINISHED GRADING

1. All areas shall be uniformly graded. The finished surface shall be reasonably smooth, compacted, and free from irregular surface changes. The degree of finish shall be that ordinarily obtainable from either blade-grader or scraper operations, except as otherwise specified. The finished surface shall be not more than 0.15 foot above or below the established grade or approved cross section. Ditches shall be finished so as to permit adequate drainage. The surface of areas to be turfed shall be finished to smoothness suitable for the application of turfing materials. The surface of the pavement subgrade shall not vary more than 0.50 foot from the established grade and approved cross-section.

#### 02150.1600 PROTECTION

1. Newly graded areas shall be protected from traffic and from erosion, and any settlement or washing away that may occur from any cause, prior to acceptance, shall be repaired and grades re-established to the required elevations and slopes, at no additional cost to the Owner. The finished subgrade shall be protected and maintained in a satisfactory condition until the stone base course is placed.