SECTION 31 23 00 - EARTHWORK

1. GENERAL
	* + 1. SUMMARY

Section Includes:

Earthwork.

* + - 1. QUALITY ASSURANCE
				1. Referenced Standards:

American Society for Testing and Materials (ASTM):

D698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb/ft3).

D1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/f(2,700 Kn-m/m)).

D2487, Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System.)

D4253, Standard Test Methods for Maximum Index Density of Soils Using a Vibratory Table.

D4254, Test Methods for Minimum Index Density of Soils and Calculation of Relative Density.

* + - 1. SUBMITTALS

Samples and Material Certifications for Imported Materials.

1. PRODUCTS
	* + 1. MATERIALS
	1. “Ledge” and “rock” include any natural compound, natural mixture and chemical element required to be excavated that, in the opinion of the Engineer, can be removed from its existing position and state only by blasting, drilling and blasting, wedging, drilling and wedging, wedging and breaking with power hand tools, or by extending the use of an approved excavating machine beyond normal and design wear and tear. No boulder, ledge, slab or other single piece of excavated material less than two cubic yards in total volume shall be considered to be ledge or rock unless, in the opinion of the Engineer, it must be removed from its existing position by one of the methods mentioned above.
	2. All other excavation shall be unclassified, including highly saturated and muck soils. Erosion control measures must be implemented to prevent soil loss from stockpiles. Unclassified excavation materials shall be removed from the site and disposed in accordance with all applicable laws and regulations. The Contractor is advised of the following:
		1. The Contractor shall employ measures and specialized equipment necessary to work efficiently given the soils and moisture conditions
	3. Common Borrow – Shall consist of earth, suitable for embankment construction. It shall be free from frozen material, perishable rubbish, peat, and other unsuitable material currently or previously contaminated by chemical, radiological, or biological agents. The moisture content shall be sufficient to provide the required compaction and stable embankment. In no case shall the moisture content exceed 4 percent above optimum, which shall be determined in accordance with AASHTO T 180, Method C or D.
	4. Loam – Shall be topsoil suitable to support vigorous growth of native vegetation, to be placed in 6-inch layer over graded excavation slope on riverbanks.
	5. Erosion Control Fabric – Shall be as specified in Section 31 25 00 Erosion, Pollution and Water Control.
2. EXECUTION
	* + 1. PROTECTION
				1. Perform all Earthwork in strict compliance with the Soil and Water Erosion and Pollution Control Plan. See Section 31 25 00 Erosion, Pollution and Water Control.
				2. Excavation performed above the waterline shall proceed such that excavation spoils are carried away from the water, or otherwise collected and contained before being allowed to contact surface waters.
				3. Protect existing surface and subsurface features on-site and adjacent to site as follows:

Employ industry standard best management practices to avoid damage to root systems of existing trees to be preserved.

Protect and maintain bench marks, monuments or other established reference points and property corners. If disturbed or destroyed, replace at own expense to full satisfaction of Engineer and controlling agency.

Verify location of utilities. Omission or inclusion of utility items does not constitute non-existence or definite location. Secure and examine local utility records for location data.

Take necessary precautions to protect existing utilities from damage due to any construction activity.

Repair damages to utility items at Contractor’s expense.

In case of damage, notify Engineer at once so required protective measures may be taken.

Maintain free of damage, existing sidewalks, structures, and pavement, not indicated to be removed. Any item known or unknown or not properly located that is inadvertently damaged shall be repaired to original condition. All repairs to be made and paid for by Contractor.

Provide full access to public and private premises, fire hydrants, street crossings, sidewalks and other points as designated by Engineer to prevent serious interruption of travel.

Maintain stockpiles and excavations in such a manner to prevent inconvenience or damage to structures on-site or on adjoining property.

Avoid surcharge or excavation procedures which can result in heaving, caving, or slides.

* + - * 1. Salvageable Items: Carefully remove items to be salvaged, and maintain unless otherwise directed.
				2. Dispose of waste materials legally, off-site. Burning, as a means of waste disposal, is not permitted.
			1. SITE EXCAVATION AND GRADING
				1. The work includes all operations in connection with excavation, borrow, construction of fills and embankments, rough grading, and disposal of excess materials required to attain the finish lines and grades as shown on the Drawings.
				2. Excavation and Grading: Perform as required by the Contract Drawings.

Contract Drawings may indicate existing grade, subgrade and finished grade required for construction of project. Stake all units, structures, piping, roads, parking areas and walks and establish their elevations. Perform other layout work required. Replace property corner markers to original location if disturbed or destroyed.

Protection of finish grade: During construction, shape and drain embankment and excavations. Maintain ditches and drains to provide drainage at all times. Protect graded areas against action of elements prior to acceptance of work. Reestablish grade where settlement or erosion occurs.

Excavations performed shall be contained with turbidity curtains, silt fences, sand filled bulk bags or other means to prevent excavated material from entering the active flow of the Sabattus River.

Engineer grants approval to begin excavations following inspection of erosion control measures.

Excavate to elevations and dimensions indicated or specified.

Excavation of accumulated sediment directly upstream of the dam structure shall take place in a manner that limits release of turbidity to the downstream river. Any excavation in the small pool of water that may be present upstream of the dam structure shall be isolated from the active flow by means of Floating Turbidity Curtain, specified in Section 31 25 00 Erosion, Pollution and Water Control. The volume of anticipated active excavation of accumulated sediment is estimated at less than 75 cubic yards.

Removal of obstructions and undesirable materials in excavation includes, but is not necessarily limited to, removal of old foundations, existing construction, logs, riprap, and any other materials which may be concealed beneath the waterline or present grade, as required to perform the Work as indicated on the Drawings. This does not include the removal of the features specified in Section 02 41 00 Structure Demolition. If undesirable material and obstructions are encountered during excavation, remove material and replace with appropriate fill material.

If ledge or rock as defined above are encountered in the required excavations and appear to require removal to satisfactorily complete the work, the Contractor shall notify the Engineer for evaluation and concurrence. No boulder, ledge, slab or other single piece of excavated material less than two cubic yards in total volume shall be considered to be ledge or rock unless, in the opinion of the Engineer, it must be removed from its existing position and state by one of the following methods: blasting, drilling and blasting, wedging, drilling and wedging, wedging and breaking with power hand tools, or by extending the use of an approved excavating machine beyond normal and design wear and tear.

Excavated materials not earmarked for salvage, stockpile and use as fill, shall be disposed of at an offsite location by the Contractor in accordance with all applicable laws and regulations. The Contractor shall spread or shape the spoils within the project site as necessary to complete the Work.

Do not carry excavations beyond that shown on the Drawings. No extra compensation will be made to Contractor for excavation beyond the grades shown on the drawings without prior approval by the Engineer

Shoring: Shore, sheet pile, slope, or brace excavations as required to prevent them from collapsing. Remove shoring as backfilling progresses but only when banks are stable and safe from caving or collapse.

Drainage: Control grading so that ground is pitched to prevent water from running into areas beyond the limits of work. Provide pumping required keeping excavated spaces clear of water during construction as required to facilitate excavation progress. Discharge of pumped water shall be in strict compliance with the Soil and Water Erosion and Pollution Control Plan. See Section 31 25 00 Erosion, Pollution and Water Control.

* + - * 1. Construct fills as required by the Contract Drawings:

Construct embankments and fills at locations and to lines and grades indicated. Completed fill shall correspond to shape of typical cross section or contour indicated regardless of method used to show shape, size, and extent of line and grade of completed work.

Provide approved fill material from salvaged onsite sources. Salvaged Fill shall be free of large roots, debris, trash or other deleterious substances, and have no particles greater than 3 inches in the maximum dimension. Salvaged Fill material should be approved by the Engineer as suitable prior to installation in the Work.

Do not place Salvaged Fill material in layers greater than 8-inch loose thickness. Place layers horizontally and compact each layer prior to placing additional fill.

Compact as required to obtain specified density listed below. Control moisture for each layer necessary to meet compaction requirements.

* + - 1. INSTALLATION
				1. Reuse masonry stone from demolition activities as needed to construct site improvements.
			2. FIELD QUALITY CONTROL
				1. The Contractor shall verify that all design grades have been achieved per the Drawings. The RPR will review finished areas of grading and check for conformance with the Drawings.
				2. Testing Agency: Owner will engage a qualified independent testing agency to perform field quality-control testing.
				3. Extent of compaction testing will be as necessary to assure compliance with Specifications.
				4. Should any compaction density test or subgrade inspection fail to meet Specification requirements, perform corrective work as necessary.
				5. Contractor shall pay for all costs associated with corrective work and retesting resulting from failing compaction density tests.
			3. EARTHWORK TOLERANCES
				1. Slope Grading

When completed, the average plane of the slopes shall conform to the slopes indicated on the Drawings, and no point on the completed slopes shall vary from the designated plane by more than 0.5 feet measured at right angles to the slope.

* + - * 1. Channel Grading

When completed, channel grades shall conform to the grades indicated on the Drawings. The grading tolerance for the channel bed and banks is +/- 0.2 feet difference from planned finish grades.

* + - 1. COMPACTION DENSITY REQUIREMENTS
				1. Assure by results of testing that compaction densities comply with the following requirements:

MATERIAL COMPACTION DENSITY

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Channel Fill: 90 percent, ASTM D698

Floodplain Surfaces: 85 percent, ASTM D698

END OF SECTION 31 23 00