

205 STRUCTURE EXCAVATION AND DEMOLITION

205.01 STRUCTURE EXCAVATION

- (A) **GENERAL.** Structure Excavation shall consist of excavation for the foundations of structures below the natural ground line and/or below the elevation of the finished roadway or roadways and appurtenances, railroad roadbed and stream channels, as shown in the contract documents.

Structure Excavation shall be excavation as shown and specified in the contract documents and/or standard drawings, including portions of existing structures encountered.

Excavation shall include removal of all materials and objects, of whatever nature encountered in excavation; disposal of excavated materials as specified herein: the construction and maintenance and subsequent removal of cribbing, sheeting, shoring and bracing; all necessary bailing, draining and pumping; and all precautions and work necessary to prevent damage to adjacent properties resulting from this excavation.

Material from the excavation that meets the requirements of [203](#) may be used as specified therein.

The elevations of the bottom of footings, as shown in the contract documents, shall be considered as approximate only and the Chief Engineer may order in writing such changes in elevations of footings as may be necessary to secure a satisfactory foundation. Payment for additional depth will be made in accordance with [205.05](#).

(B) CONSTRUCTION REQUIREMENTS

- (1) **General** - The Contractor shall notify the Chief Engineer a sufficient length of time in advance of the beginning of any excavation, so that cross sections may be taken of the undisturbed ground.

The Contractor shall submit, in accordance with [105.02](#), drawings showing his proposed method of sheeting, bracing and shoring construction and other pertinent features not shown in detail in the contract documents. Such drawings and features shall be approved by the Chief Engineer before construction is started, but this approval shall not relieve the Contractor of any of its responsibility for constructing and maintaining this construction. The determination of sheet piling lengths shall be the sole responsibility of the Contractor.

All excavation adjacent to existing pavements and structures shall be sheeted, shored, braced and supported in a substantial manner to prevent settlement, movement or damage to the existing pavement or structure.

The Contractor, at his own expense, so as to provide necessary clearances and dimensions, shall correct any movement or bulging of shoring that occurs

After each excavation is completed, the Contractor shall notify the Chief Engineer, and no foundation piles shall be driven or concrete placed until after the Chief Engineer has given his approval.

Material forced above the plan elevation of the bottom of the foundation or tremie seal by the pile driving shall be removed at the Contractor's expense.

The use of explosives shall be by permit and under conditions as directed by the Chief Engineer.

All sheeting, shoring, and bracing involved shall be removed by the Contractor after the completion of the permanent structure, in a manner so as not to disturb or mar the structure. Sheeting may be left in place only by written permission from the Chief Engineer, subject to such conditions as the Chief Engineer may require. No payment will be made by the District for such sheeting, shoring and bracing so left in place.

No excavated material shall be deposited at any time so as to endanger portions of the new or an adjacent structure, either by direct pressure or indirectly by overloading banks contiguous to the operation, or in any other manner. Material, if stockpiled, shall be stored so as not to interfere with the established sequence of the construction or future work by others as determined by the Chief Engineer. If there is not sufficient area available for stockpiling within the limits of the project, the Contractor will be required to furnish his own area for stockpiling.

All material shall be removed from the limits of the work and be disposed of by the Contractor. The Contractor will be required to furnish his own disposal area.

- (2) **Preparation of Foundations.** It is intended that all footings shall be constructed in open excavations, where practicable, and that all such excavations shall be completely dewatered and kept dewatered for the placing of all concrete and backfill. Elevations for the bottom of the footings shown on the contract documents shall be considered approximate only. The Chief Engineer may, during construction, direct changes in dimensions or elevations of footings to achieve a satisfactory foundation.

All rock or other hard foundation material shall be free of all loose material, cleaned and cut to a firm surface, either level, stepped, or roughened, as may be directed by the Chief Engineer. All seams shall be cleaned out and filled with concrete, mortar, or grout.

When masonry is to rest on an excavated surface other than rock, care shall be taken not to disturb the bottom of the excavation and the final removal of the foundation material to grade shall not be made until just before the masonry is to be placed. If in the event the foundation becomes wet and spongy or otherwise unsatisfactory prior to the placing of concrete thereon, the Contractor shall, at no additional cost to the District, remove the unsuitable material and replace it with suitable material to secure an adequate foundation, as determined by the Chief Engineer.

Pumping from the interior of any foundation enclosure shall be done in such a manner as to preclude the possibility of the movement of water through any fresh concrete. No pumping will be permitted during the placing of concrete or for a period of at least 24 hours thereafter, unless done from a suitable sump separated from the concrete work by a watertight wall or by means of well points.

Faces of footings shall be placed plumb against undisturbed material, rock, sheeting, shoring or forms. Faces of footings in rock shall bear against a minimum 1 ft depth

of rock. If the excavation will not stand plumb, the Contractor shall furnish and install sheeting, shoring or forms as required.

- (3) **Cofferdams.** In the event that the construction of the foundation requires underwater construction, the Contractor shall submit drawings for approval, in accordance with [105.02](#), showing his proposed method of cofferdam construction and other pertinent features. Cofferdams shall be constructed so as to protect green concrete against damage from sudden rising of the stream or river. Bracing shall not extend into the substructure masonry.

The areas included within cofferdam construction shall be such that forms can be placed inside the sheeting for the sides of the concrete footings and so that any leakage into the enclosed area may be conducted to pumps outside of the footing forms. Cofferdams shall be of such dimensions that there will be no reduction in the net size of concrete base or tremie seal course shown in the contract documents and also to insure that, with the pile driving equipment proposed for use, all piles can be driven in their correct position with the batter specified. Should any sheet piles or other walls of cofferdams encroach upon the net minimum dimensions of tremie seal course shown in the contract documents, the cofferdams shall be reconstructed as necessary to clear the minimum lines. Sheet piles, if used, shall be driven sufficiently below the bottom of excavation and of concrete to provide adequate lateral support for the piles and to allow excavation to the full depth required. The effect of such penetration on the position of battered piles shall be provided for in the cofferdam design. In no case shall horizontal wales extend more than 12 inches inside the net concrete dimensions of the seal courses as shown in the contract documents.

Any pumping from the interior of the foundation enclosure that may be permitted shall be done in such a manner as to preclude the possibility of any portion of the concrete materials being carried away. No pumping will be permitted during the placing of concrete, or for a period of at least 24 hours thereafter, unless it is done from a suitable sump separated from the concrete by a watertight wall. Pumping to dewater a sealed cofferdam shall not commence until the seal has set sufficiently to withstand the hydrostatic pressures.

Removal of sheeting, shoring, and bracing shall be as specified in [205.01\(A\)](#), except that, at the Contractor's option, all parts of cofferdams and similar temporary construction below the level of top of concrete tremie seal course may be allowed to remain in place, but no payment will be made for such sheeting, shoring, or bracing so left in place.

Unless permitted by the Chief Engineer, no excavation shall be made outside of the cofferdam. If any excavation or dredging is made at the site of the structure before caissons, cribs, or cofferdams are sunk or are in place, the Contractor shall, at no additional cost to the District, after the foundation base is in place, backfill all such excavation to the original ground surface or riverbed with material satisfactory to the Chief Engineer. Material deposited within the stream area from foundation or other excavation or from the filling of cofferdams shall be removed and the stream area freed from obstruction thereby.

205.02 DEMOLITION

- (A) **GENERAL.** Demolition shall consist of complete or partial removal and disposal of various materials from existing structures as shown and specified in the contract documents.
- (B) **CONSTRUCTION METHODS.** All items designated to be wholly or partially removed shall conform to the contract plans and specifications, unless otherwise approved by the Chief Engineer. Any material removed beyond authorized limits, or any portion of remaining structure damaged as a result of negligence on the part of the Contractor, shall be replaced or repaired by the Contractor at his own expense. Before cutting or disconnecting members the Contractor shall assure himself that members are adequately supported. The Contractor shall also construct and maintain protection shields about the trees in the vicinity of the work to prevent inadvertent damage during the length of the project. The use of explosives and blasting procedures is prohibited, unless specifically granted by permit.

Prior to partial concrete removal, the perimeter of the area to be removed shall be carefully saw cut to a neat line. The cut lines shall be made down to the outside layer of reinforcing steel making sure that bars to be retained are not damaged. No debris shall be deposited, dropped, placed or secreted within the waters or land beneath or adjacent to the structure. Material shall be removed daily and not allowed to accumulate on or adjacent to the project site.

- (1) **Protection Shield** - Prior to any removal, a protection shield, meeting the requirements of [626](#), shall be properly installed in the work zone area. The shield shall remain in place until all construction activity related to the appropriate phase is completed.
- (2) **Support of Existing Structural Elements** - Particular care shall be exercised in all operations to prevent collapse or damage to portions of the structure which are to remain or reused. The Contractor shall assure the Chief Engineer that all structural elements are adequately supported before disconnecting or removing them.

Prior to removal of any structural elements, the Contractor shall design adequate temporary supports in accordance with [703.16](#), False work and Centering. Working drawings with calculations prepared and stamped by a Registered Professional Engineer shall be submitted to and approved by the Chief Engineer showing all temporary supports prior to beginning work.

- (3) **Reinforcing Steel** - Existing reinforcing steel to be retained for splicing with new steel shall be cleaned, straightened or bent as required and cut to the desired length. New steel shall be spliced to existing steel as per AASHTO requirements.

When existing reinforcing steel to be retained is damaged during demolition, the Contractor shall, at his own expense, substitute a bar of equal size drilled in and grouted to the required lap as per AASHTO requirements.

Where projecting bars are not to extend into the new construction, they shall be cut off flush with the surface to which the concrete has been removed. Cleaning reinforcing steel and removal of excessive length of bars shall be included as part of this work. All material removed shall be disposed of outside the construction area.

205.03 STRUCTURE HARD SURFACE PAVEMENT EXCAVATION

- (A) **GENERAL.** This work shall consist of removal and disposal of concrete from existing structures such as retaining walls, median barriers and concrete islands to the limits as specified in the contract documents. Included in this work is saw cutting to a neat line the perimeter of the area to be removed and carefully removing the material to the indicated depth so as not to damage electrical conduits and reinforcing steel to remain in place. Also included is cleaning, bending or straightening as required and cutting existing reinforcing steel to remain in place as shown on the contract plans and as directed by the Chief Engineer.
- (B) **CONSTRUCTION REQUIREMENTS.** Prior to the removal of any concrete, the perimeter of the area to be removed shall be carefully saw cut to a neat line. The cut shall be sufficiently shallow to avoid damaging the existing reinforcing steel to remain in place. Concrete shall be carefully removed so as not to damage the structure to remain. Restrictions may be placed in the contract specifications on the type and size of demolition equipment to be used.

Concrete shall not be removed beyond the specified limits without the approval of the Engineer. Concrete that is removed or damaged by the Contractor beyond the limits of removal shall be saw cut, removed and replaced at the Contractor's expense.

Existing Reinforcing Steel - Existing reinforcing steel to be retained for splicing with new steel shall be cleaned, straightened or bent as required and cut to the desired length. When existing reinforcing steel to be retained is damaged during removal of concrete, the Contractor shall, at his own expense, substitute a bar of equal size drilled in and grouted in the existing concrete to achieve the required 30 bar diameters or spliced length as specified on the plans.

In areas where the required length for splicing cannot be achieved, the Contractor shall use a mechanical bar splice, equal to 125% of the strength of the bars, to connect the new bar to the existing bar. Welding of reinforcing steel shall not be permitted.

Where projecting bars are not to extend into the new construction, they shall be cut off flush with the surface of the existing concrete.

205.04 MEASURE

- (A) **STRUCTURE EXCAVATION.** The unit of measure for Structure Excavation will be the cubic yard. The number of cubic yards will be computed by the average end area method. However, at locations where end area measurements cannot be taken which will produce the requisite accuracy the Engineer may substitute other methods to determine the correct quantities.

Cross sections will be taken of the undisturbed ground. Any materials removed or excavated before these measurements have been taken will not be included in the number of cubic yards measured. Trenches or foundation pits for structures or structure footings shall be excavated to the elevations shown, and any material excavated below that elevation, unless ordered in writing by the Chief Engineer, will not be measured.

Excavations will be computed from the actual dimensions of the excavated area limited by vertical planes 18 inches outside of and parallel to the footings and a horizontal plane at the bottom of footings or tremie seals to limits as shown in the contract documents.

- (B) **STRUCTURE HARD SURFACE EXCAVATION.** The unit of measure will be the cubic yard.
- (C) **COFFERDAM.** The unit of measure for Cofferdam will be the job. No direct measure will be made.
- (D) **DEMOLITION.** The unit of measure for Demolition will be the job. No direct measure will be made.

205.05 PAYMENT

- (A) **STRUCTURE EXCAVATION.** The number of cubic yards of Structure Excavation, as measured, will be paid for at the contract unit price per cubic yard, which payment will include the excavation, removal and disposal of all material, and all labor, materials, tools, equipment, and incidentals necessary to complete the work.

When it is necessary, in the opinion of the Chief Engineer, to carry the excavation below the elevations shown on the plans, the excavation for the additional depth will be paid for as follows:

The first 3 feet below plan elevation will be paid for at the contract unit price. From 3 to and including 6 feet below plan elevation will be paid for at 125 percent of the contract unit price. From 6 to and including 9 feet below plan elevation will be paid for at 150 percent of the contract unit price. Excavation in excess of 9 feet below plan elevation will be paid for as extra work subject to the provisions of the contract.

- (B) **STRUCTURE HARD SURFACE EXCAVATION.** Payment for Structure Hard Surface Excavation will be made at the contract unit price per cubic yard, which payment will include saw cutting the perimeter to a neat line, removal and disposal of all materials, cleaning, bending and cutting of reinforcing steel to remain and all labor, tools, equipment and incidentals needed to complete the specified work.
- (C) **COFFERDAM.** Payment for Cofferdam will be made at the contract lump sum price, which payment will include furnishing all materials, construction of the cofferdam, underwater cleaning, dewatering, required treatment of effluent and sediments, maintenance of the cofferdam during construction, removal and disposal of all materials and all labor, tools, equipment and incidentals necessary to complete the work.
- (D) **DEMOLITION.** Payment for Demolition will be made at the contract lump sum price, which payment will include preparation of required working drawings, furnishing all materials, installing and disposing of temporary supports, removal and disposal of all materials, saw cutting the perimeter to a neat line, and furnishing all labor, tools, equipment and incidentals needed to complete the specified work.