

Massachusetts Department of Transportation – Highway Division
Standard Specifications for Highways and Bridges

Test pits to locate underground services shall be excavated where directed and will be classed as Class A Trench Excavation. The Contractor shall take special care during this excavation to avoid damage to any underground structures or utilities. When necessary the Contractor shall cooperate with representatives of public service companies in order to avoid damage to their structures by permitting them to erect suitable supports, props, shoring or other means of protection.

140.23: Class B Trench Excavation

Class B Trench Excavation shall include the removal and satisfactory disposal of all materials, except Class B Rock Excavation, encountered in the construction of drainage and water pipes greater than the 5-ft maximum depth specified in Section 200: Drainage.

Trench excavation for pipe laying in roadway cuts shall include only that portion of the trench which is below the roadway excavation except where the Engineer orders in writing, that the trench excavation and its backfill shall be completed before the roadway excavation is begun.

140.24: Channel Excavation

Channel Excavation shall include the removal and satisfactory disposal of all materials other than those classified as Bridge Excavation, Trench Excavation, Muck Excavation or Rock Excavation when encountered in the excavation for streams or rivers or excavation on new locations for same in connection with drainage structures having a clear span of 8 ft or more.

140.25: Class B Rock Excavation

This item shall include the removal and satisfactory disposal when encountered in the excavation for drainage structures, fences, highway guard, posts, bounds, pipes, ducts, walls, open trenches and bridge structures of:

- (A) Boulders measuring 1 yd³ or more and all solid rock that requires blasting or breaking by hand power tools (such as jackhammers etc.) prior to removal.
- (B) Masonry removed from the walls, covers and other portions of existing drainage structures, also plain and reinforced concrete pavements, and masonry removed from bridge substructures.

Removal operations shall be so prosecuted that no damage will be caused to adjacent structures or property.

140.26: Drainage Structures Abandoned or Removed

The work shall consist of the removal and stacking of iron castings. The plugging of inlets and outlets and the filling of all drainage structures designated to be abandoned and the removal of all masonry and filling the cavity of the drainage structures designated to be removed

140.27: Test Pits for Exploration

Test pits shall be excavated where and as directed by the Engineer. The contractor shall take special care during the excavation to avoid damage to any existing structure or conduit. Hand excavation may be required to ensure no damage to surrounding utilities.

through the deposited concrete. When necessary to move the tremie it shall be lifted out of the concrete and moved to the new position. Spacing of the tremies shall be at the Contractor's option.

After each excavation is completed, the Contractor shall notify the Engineer and no constructions shall be started until the Engineer has approved the depth of the excavation and the character of the foundation material.

All parts of the cofferdams shall be removed after the completion of the substructure, care being taken not to disturb or otherwise injure the finished masonry.

Sheet piling used in the construction of cofferdams may be left in place at the option of the Contractor, provided it is cut off at an elevation as may be directed by the Engineer, and the cutoff portions are removed from the site.

D. Excavation for Stepped Footings.

Where the footings for bridges are shown stepped, the Contractor shall sheet and shore the existing ground so that adjacent sections of the footings will rest on undisturbed ground according to the pattern shown on the plans. The sheeting shall be strong enough to support the earth along the designated lines, tight enough to restrain the fines in the concrete, and shall be left in place to the extent required to hold the concrete that is to be placed against it. Before the concrete is placed, the sheeting shall be cut so that none of the sheeting will extend into the concrete. Shoring and bracing shall be removed. If rock is encountered, it shall be stepped to the pattern shown and sheeting will not be required.

E. Water Control in Foundation Area.

When concrete for the foundations of a structure is to be placed in the dry, the Contractor shall use such equipment and perform their operations in such a manner that boiling or other disturbances of the ground in the foundation area will be prevented and shall keep the area being excavated dry by such means that will prevent the entering of water through or from the adjacent ground, if such entering water could affect the stability of the foundation material or the adjacent ground or the foundations.

No surface pumping will be allowed. Water shall be controlled by means of properly screened sumps or well points. If sumps are used, they shall be installed at strategic locations but not closer than 5 ft from the nearest edge of the footing.

The contractor shall provide temporary diversion channels, excavations, embankments, sheeting, drains, flumes, well point unwatering systems, pumps, or other effective procedures or structures together with all labor, materials and equipment necessary for unwatering the foundation areas. Such work shall be subject to the approval of the Engineer, but such approval will not relieve Contractor of responsibility for the adequacy of construction, maintenance, operation and safety of the water control system. Upon completion of the work all temporary embankments and structures shall be removed from the site. All temporary excavations shall be backfilled in accordance with the applicable provisions of Subsection 150: Embankment for forming embankments or as directed.

F. Shoring and Bracing of Trenches.

Shoring and bracing of trenches and other excavations shall be in accordance with all OSHA requirements.

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Excavation made outside the lines prescribed for payment will be considered as made for the Contractor's convenience and will not be included for payment under any item of excavation, nor will the refilling of any such area be included under any item of filling material.

Class A Trench Excavation shall be measured as follows:

For masonry culverts (having a clear square span of less than 8 ft), inlets and walls, a width of 1 ft outside the base of the masonry section shown on the plans and to the depth required. Trench excavation for walls in cuts shall include only that portion below the elevation of the subgrade adjacent to the wall. For walls where an embankment is proposed, trench excavation shall be only that portion between the existing ground and the bottom of the foundation. All other Class A Trench Excavation will be measured according to the amount of materials removed to the lines and grades shown on the plans or as directed.

Class B Trench Excavation shall be measured as follows:

For pipe culverts, drains and water pipes the depth of excavation shall be measured from the bottom of the pipe barrel to the bottom of the roadway excavation or existing ground, whichever is lower, as determined above the center line of the pipe, less 5 ft. The width of excavation shall be 3 ft greater than the rated inside diameter of the pipe up to a point 5 ft above the bottom of the pipe barrel and a width above that point equivalent to the base width plus an allowance for 1 to 1 slopes on the sides of the trench for the measured depth described above. The allowance for 1 to 1 slopes will be included regardless of the actual slope excavated or whether sheeting or shoring is used that is not included for payment under Subsection 950: Sheeting. The sides of the trench excavation will be considered vertical when sheeting is used and paid for separately under Subsection 950: Sheeting and the width shall be 3 ft greater than the inside diameter of the pipe. If necessary to obtain a satisfactory foundation for pipe culverts, drains and water mains, trenches, shall be excavated deeper than normally required for bedding the pipe and such excavation below the barrel of the pipe will be measured for payment under this item. The width of trench shall be 3 ft greater than the rated inside diameter of the pipe and the depth shall be the actual depth as directed by the Engineer.

Class B Rock Excavation shall be measured as follows:

Pay limit for rock excavation actually removed in all masonry culverts, walls and bridges, will be up to a limit of 1 ft outside of the foundation. This rock excavation in cuts shall include only that portion below the limits of payment of Roadway Earth Excavation or Class A Rock Excavation and in embankment only that portion below the surface of the existing ground.

Pay limit for rock actually excavated in pipe trenches will be made to a width of 2 ft greater than the rated inside diameter of the pipe barrel, providing rock extends to that width. The maximum depth of rock to be paid for shall be equal to the difference in depth between the top of the original rock in the trench and a line 12 in. below the bottom of the outside of the pipe barrel. No part of any rock remaining in the trench shall come within 6 in. of any portion of the pipe. Rock actually excavated in the construction of catch basins, manholes, and leaching basins will be calculated on a basis of 1 ft outside of the outer walls and 6 in. below the bottom of the structure. Rock excavation in subdrain trenches will be measured as specified above for pipe trenches.

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Rock excavation in post and bound holes not already paid for in previous rock excavation shall be based on an area 2 ft² multiplied by the depth of rock encountered in the post or bound hole required plus 6 in.

Rock excavation in channel excavation will be measured as specified in 120.22: Class A Rock Excavation.

The unit of measurement for drainage structure abandoned or removed will be each structure abandoned for each structure removed, complete.

Test Pit for Exploration will be measured as the actual volume removed to the limits established by the Engineer.

140.81: Basis of Payment

Excavation for structures will be paid for at the contract unit price per cubic yard under the item for the particular type of excavation encountered.

The unit price per cubic yard shall include all backfilling when the materials are obtained from excavation, all clearing and grubbing (except as may be otherwise provided on the plans or in the Specifications), all excavations for the structure formation of embankments, disposal of surplus material, and the furnishing of all equipment, tools, labor and work incidental thereto.

If cofferdams, sheeting, shoring, bracing, unwatering system or other method of control for excavation are not specific items in the Contract, no allowance in addition to the prices bid for any items in the Contract will be made for such controls, or for labor, equipment or materials required. If any change in depth of foundation greater than 2 ft or in other dimensions of the foundation is directed by the Engineer after the controls have been provided, and if such change is greater than can be accommodated by the controls as constructed by the Contractor with the approval of the Engineer, then any changes made as directed by the Engineer will be paid for in accordance with the Contract provisions for Extra Work. Excavation, borrow, concrete or other items of work done within the controlled area will be paid for only at the contract prices for these items unless the operations require different or additional equipment or labor in addition to or different from that required for the original design of the control. If such different or additional equipment or labor is required to perform the operation for the pay unit of an item the additional costs will be paid for under Extra Work. Where salvage of material is involved in the additional work, the value of the salvage shall be deducted from the additional payment.

Backfilling when not obtained from excavation will be paid for at the contract unit price for the kind of material used.

Bridge Excavation will be paid for at the contract unit price per cubic yard under Item 140. Bridge Excavation. Bridge excavation within a cofferdam and included in the Proposal as a separate pay item will be paid under Item 140.1. Bridge Excavation within Cofferdam. All other excavation encountered in the construction of bridges, culverts (spans 8 ft or more) and major wall structures, not otherwise defined in these specifications will be classified and paid for as Earth Excavation.

Class A Trench Excavation will be paid for at the contract unit price per cubic yard of Class A Trench Excavation except that where the depth is greater than 8 ft, that excavation below the 8-ft depth will be paid for at a price per cubic yard equal to 1.5 times the price bid per cubic yard for Class A