

To Convert From	To	Multiply By
Inch	Metre (m)*	.0254 or 2.54×10^{-2}
Foot	Metre (m)	.3048 or 3.048×10^{-1}
Foot ²	Metre ² (m ²)	.092903040 or 9.2903040×10^{-2}
Yard ²	Metre ² (m ²)	.836127360 or $8.36127360 \times 10^{-1}$
Foot ³	Metre ³ (m ³)	.028316847 or 2.8316847×10^{-2}
Yard ³	Metre ³ (m ³)	.764554858 or $7.64554858 \times 10^{-1}$
Pound (Mass)	Kilogram	.453592370 or $4.53592370 \times 10^{-1}$
Gallon (U.S.)	Metre ³ (m ³)	.003785411784 or $3.785411784 \times 10^{-3}$
Metre	Inch	39.37007874
Metre	Foot	3.280839895
Metre ² (m ²)	Foot ²	10.76391042
Metre ² (m ²)	Yard ²	1.195990046
Metre ³ (m ³)	Foot ³	35.31466621
Metre ³ (m ³)	Yard ³	1.307950619
Kilogram	Pound (Mass)	2.204622622
Metre ³ (m ³)	Gallon (U.S.)	264.172052

Additional information and conversion factors can be found in AASHTO Specification R1 or ASTM E 380.

*The spelling "metre" is preferred by AASHTO, although "meter" is widely used.

SECTION 110 ENVIRONMENTAL PROTECTION

110.01 DESCRIPTION.

This work consists of operational controls to be practiced and temporary pollution control measures to be taken to aid in controlling erosion and water pollution resulting from construction operations.

Temporary erosion and pollution control measures to be taken shall be those shown on the Plans, proposed by the Contractor and approved by or ordered by the Engineer during the life of the Contract. The work shall provide prevention, control, and abatement of water pollution through the use of berms, dikes, dams, sediment basins, fiber mats, netting, gravel, mulches, grasses, slope drains, and other erosion control devices or methods.

Temporary erosion and pollution control measures shall be coordinated with permanent erosion control features specified elsewhere in the Contract to the extent practical to assure economical, effective, and continuous erosion control throughout the construction and post-construction period.

Temporary pollution control may include construction work outside the Right of Way where roadway associated construction is necessary. This includes borrow pit operations, haul roads, equipment storage sites, and plant sites.

110.02 MATERIALS.

Mulches may be hay, straw, fiber mats, netting, wood cellulose, corn stalks, bark, corn cobs, wood chips, or other suitable material acceptable to the Engineer. Mulches shall be clean and free of noxious weeds and deleterious materials.

Slope drains may be constructed of pipe, fiber mats, rubble, portland cement concrete, bituminous concrete, plastic sheets, or other material acceptable to the Engineer that adequately controls erosion.

Grass shall be quick-growing species suitable to the area and should provide a temporary cover which will not later compete with grasses sown for permanent cover.

Sediment basins, sediment traps, barriers, and filters may be constructed by using staked hay or straw bales in conjunction with necessary earthwork.

110.03 PRECONSTRUCTION CONFERENCE.

The Contractor shall submit in writing, for acceptance at the preconstruction conference or before starting work on the construction, a temporary erosion and pollution control plan. This plan shall include erosion and pollution controls on the project site, haul roads, borrow pit sites, plant sites, and the disposal of waste materials. No work shall be started until the plan for pollution control and prevention has been accepted by the Engineer.

110.04 OPERATIONAL CONTROLS.

Work Areas. Where a work area is adjacent to a live stream or lake, or runoff water from the work area enters a live stream or lake, the Contractor shall erect barriers or provide sediment basins to prevent direct runoff from reaching the live stream or lake.

Material shall not be transported across a live stream by fording. A temporary bridge or crossing shall be used for this purpose.

Mechanized equipment shall not be operated in a live stream channel except to construct required crossings or barriers and fills at channel changes.

Wash water from aggregate washing or other operations shall be held in a settling basin to prevent muddy water from entering the live stream or lake.

Portland Cement, fresh Portland Cement Concrete, oily or greasy material or waste material shall not be dumped into or allowed to enter a live stream or lake.

The Contractor shall be responsible for the proper disposal of all removed concrete, pavement, foundations, and other unsuitable material. The disposal site shall not be a wetland and shall be a site acceptable to the Engineer.

Compliance with these controls shall not relieve the Contractor of the responsibility to comply with other provisions of the Contract, nor the responsibility for damage and preservation of property.

110.05 EROSION CONTROLS.

The Engineer has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and fill operations; and to direct

the immediate installation of permanent or temporary pollution control measures to prevent contamination of adjacent streams, watercourses, lakes, ponds, or other areas of water impoundment. Such work may involve construction of temporary berms, dikes, dams, sediment basins, slope drains, and use of temporary mulches, mats, seeding, or other control devices or methods as necessary to control erosion. Embankment and cut slopes shall be seeded and mulched as excavation proceeds to the extent considered desirable and practicable.

The Contractor shall incorporate all permanent erosion control features into the Project at the earliest practical time as outlined in the accepted Plan. Temporary pollution control measures shall be used to correct conditions that develop during construction, that are needed before installing permanent pollution control features, or that are needed temporarily to control erosion during construction. These temporary measures are not associated with permanent control features on the Project.

Clearing and grubbing operations shall be scheduled and performed so grading operations and permanent erosion control features can follow immediately if Project conditions permit; otherwise temporary erosion control measures may be required between successive construction stages.

The extent of clearing and grubbing operations and the excavation, borrow, and embankment operations for two-lane construction shall not cover a distance of more than 3 miles. No work shall start in the fourth mile until necessary erosion and pollution control measures are completed in the first mile.

The extent of clearing and grubbing operations and the excavation, borrow, and embankment operations on four-lane construction shall cover a distance of not more than 2 miles. No work shall start in the third mile until necessary erosion and pollution control measures have been started in the first mile.

On grade widening and selective grading Projects, the Engineer will limit the extent of clearing and grubbing, excavation, borrow, and embankment operations in progress commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding, and other such permanent erosion and pollution control measures current. Construction operations shall be limited to 5 miles until erosion and pollution control measures have been started in the first mile.

When a suspension of work is ordered or when operations on the Project are suspended for the winter, the Contractor shall take all action necessary to control erosion, pollution, and runoff during the shutdown period before the Department accepts responsibility for maintenance.

110.06 METHOD OF MEASUREMENT AND PAYMENT.

- A. When temporary erosion and pollution control measures are required due to Contractor's negligence, carelessness, or failure to install permanent controls as part of the scheduled work and are ordered by the Engineer, the work will not be measured for payment and shall be done by and at the Contractor's expense.
- B. Temporary erosion and pollution control work required, but not due to the Contractor's negligence, carelessness, or failure to install permanent controls, shall be performed as ordered by the Engineer. Work items required for this control work that have a Contract price shall be measured as provided by the Specifications for

that item of work. Work items used or required that are not a Contract item will be measured and paid for according to Section 104.03 D.

- C. Should the Contractor fail to control erosion, pollution, and siltation, the Engineer will employ outside assistance or state forces to do the work. The direct costs, overhead costs, and engineering costs incurred under these conditions will be deducted from payments due the Contractor for work done on the Contract.

