SECTION 204 - EXCAVATION AND BACKFILL
FOR MISCELLANEOUS FACILITIES

204.01 Description. This section describes the following:

(A) Excavating and backfilling to depths and lines established for foundations of roadway and sign lighting standards, and traffic signal standards.

(B) Excavating and backfilling trenches for utilities pipes (including water, sewer, telephone, oil, and gas lines) and conduits (including roadway and sign lighting, traffic signal, and other communications systems).

(C) Excavating and backfilling for water and sewer manholes and appurtenances.

(D) Disposing of surplus material from excavations.

Excavating and backfilling for water and sewer pipes, manholes, and appurtenances are described further in Section 624 – Water System and Section 625 – Sewer System.

204.02 Materials.

Structure Backfill Material 703.20
Trench Backfill Material 703.21
Geotextiles for Underdrain Applications 716.03
Cullet and Cullet-Made Materials 717

Structure and trench backfill material shall include mixture of aggregate and cullet. When cullet is not produced on the project island, or material unit price of cullet is greater than material unit price of structure backfill or greater than material unit price of trench backfill, cullet may be excluded for that backfill application. Before excluding cullet, submit availability and pricing documentation.

Trench gravel backfill material shall conform to AASHTO M 43, size number 67. When tested in accordance with AASHTO T 96, the LA abrasion shall not exceed 40 percent at 500 revolutions.

Controlled Low Strength Material (CLSM) in accordance with Section 314 – Controlled Low Strength Material (CLSM) for Utilities and Structures may be used in place of trench and structure backfill material, subject to the Engineer’s acceptance.
Where CLSM is allowed, provide drainage system to accommodate underground water seepage. CLSM will not be allowed as trench backfill when installing aluminum and aluminum-coated pipe conduits.

Provide plastic marking tape that is acid and alkali-resistant polyethylene film, 6 inches wide with minimum thickness of 0.004 inch. Provide tape with minimum strength of 1750 psi lengthwise and 1500 psi crosswise. Manufacture tape with integral wires, foil backing, or other means to enable detection by a metal detector when tape is buried up to 3-feet deep. Manufacture tape specifically for marking and locating underground utilities. Provide metallic core of tape encased in a protective jacket or provided with other means to protect it from corrosion. Tape shall conform to the following colors and shall bear a continuous printed inscription describing the specific utility: Red: Electric; Yellow: Gas, Oil, Dangerous Materials; Orange: Telephone, Telegraph, Television, Police, and Fire Communications; Blue: Water System; Green: Sewer Systems.

204.03 Construction.

(A) Structure and Trench Excavation.

(1) General. Notify the Engineer 10 working days before excavating for structures and trenches.

The Contractor shall be responsible for the stability of temporary open cuts during construction of structures or trenches and shall take appropriate measures to meet OSHA requirements.

Excavate in such a manner as to prevent damage to pavements, sidewalks, structures, landscaping, and other improvements. Excavate immediately before installation of conduit and other appurtenances. Stockpile excavated material in a location that shall not cause damage, obstruct vehicular and pedestrian traffic, or interfere with surface drainage.

In excavation operations, do not disturb ground below elevations indicated in the contract documents. If ground below elevations indicated in the contract documents is disturbed, excavate disturbed ground until undisturbed ground is reached. Backfill this area with Class D concrete until required foundation elevation is reached.

Keep foundation excavation dry by draining, bailing, pumping, or driving sheathings.

When material from excavation does not meet quality requirements specified for backfill in accordance with Subsection 204.02 – Materials, furnish conforming material, as required.
Deposit remaining structure or trench excavation material that
is not used as backfill, in roadway embankments in accordance with
Subsection 203.03(B)(1) – Selected Material. Dispose of surplus
selected material in accordance with Subsection 203.03(B)(3) –
Surplus Selected Material.

(2) Foundation Treatment. When footing concrete or masonry is
to rest upon rock, fully uncover rock and remove rock surface to a
depth sufficient to expose sound rock. Roughly level rock surface or
cut to steps; and roughen rock surface.

Grout seams in rock under pressure. The Engineer will pay
cost in accordance with Subsection 104.02 - Changes.

While excavating for non-pile foundations where footing
concrete or masonry is to rest on an excavated surface other than
rock, do not disturb excavation bottom. Remove foundation material
to final grade immediately prior to placing concrete or masonry.

Complete driven pile foundation excavation to footing bottom
before driving piles therein. Remove excess materials remaining in
the excavation, after pile driving, to footing bottom elevation.

In pile foundations, excavating a sufficient distance below
footing bottom will be allowed, as indicated in the contract documents,
at no increase in contract price or contract time. When ground
surface has risen above plan grade after pile driving, remove surplus
material at no increase in contract price or contract time. When
ground surface is below plan grade after pile driving, backfill and
compact to plan grade with acceptable material, at no increase in
contract price or contract time.

(3) Inspection. When the Engineer needs to determine character
of foundation material, excavate test pits, drill test borings, and
perform foundation bearing tests in accordance with Section 211 -
Exploratory Work at Structure Footings.

When structure excavation to foundation grade is completed,
request that the Engineer inspect and accept foundation elevation and
character before placing concrete or masonry and reinforcing steel in
the footing.

(B) Structure and Trench Backfill. Do not deposit fill material against
back of foundations and manholes until test samples indicate that concrete
has developed strength required in Subsection 503.03(E) – Loading.
Cure test samples under conditions similar to those affecting the structure. Continue backfilling so that excessive unbalanced loads are not introduced against the structure.

Place backfill material in uniform horizontal layers not exceeding 8 inches in loose thickness, before compaction. Moisten and compact each layer of backfill until relative compaction of not less than 95 percent is achieved in accordance with Subsection 203.03(C)(2) – Relative Compaction Test. The Engineer may reduce 95 percent compaction requirement in situations where such compaction is not feasible.

When the Engineer cannot use field density test, compact each layer of backfill with vibratory or other accepted equipment on granular backfill material.

Compaction of backfill material by ponding or jetting will not be allowed.

Where bottom of utility pipe is located within 12 inches or below normal ground water level, use trench gravel backfill material to at least 12 inches above pipe or to bottom of pavement structure. Gravel material shall be completely encapsulated by geotextile conforming to Subsection 716.03 - Geotextiles for Underdrain Applications.

When required, place sufficient fill at structures, utility pipes, and conduits ahead of other grading operations to permit public traffic to cross.

Compact backfill material in the following areas to a relative compaction of not less than 90 percent:

(1) Footings not beneath surfacing.

(2) Other locations where the contract documents indicate 90 percent relative compaction for structure or trench backfill.

Place plastic marking warning tapes for appropriate type of utility directly above pipe, within a depth of 3 feet from finish grade, unless otherwise indicated in the contract documents.

204.04 Measurement.

(A) Trench excavation will be paid on a lump sum basis. Measurement for payment will not apply.

(B) Trench backfill will be paid on a lump sum basis. Measurement for payment will not apply.
204.05 Payment. The Engineer will pay for the accepted pay items listed below at the contract price per pay unit, as shown in the proposal schedule. Payment will be full compensation for the work prescribed in this section and the contract documents.

The Engineer will pay for each of the following pay items when included in the proposal schedule:

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trench Excavation for_________________</td>
<td>Lump Sum</td>
</tr>
<tr>
<td>Trench Backfill for___________________</td>
<td>Lump Sum</td>
</tr>
</tbody>
</table>

The Engineer will pay for removal of material from depths greater than 3 feet below depths indicated in the contract documents in accordance with Subsection 104.02 - Changes.

The Engineer will not pay for trench excavation for roadway and sign lighting and traffic signal system conduits separately and will consider the cost for those items as included in the contract prices for the various contract pay items. The cost is for work prescribed in this section and the contract documents.

The Engineer will not pay for structure excavation and structure backfill for miscellaneous facilities separately and will consider the cost for those items as included in the contract prices for the various contract pay items. The cost is for the work prescribed in this section and the contract documents.

The Engineer will not pay for excavation and backfill for water and sewer manholes and appurtenances separately and will consider the cost for those items as included in the contract prices for the various contract pay items. The cost is for the work prescribed in this section and the contract documents.

END OF SECTION 204