

SPECIFICATION SECTION 04200 – DITCHES

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SPECIFICATION SECTION 04200 - DITCHES

1. DESCRIPTION

This Specification Section prescribes the work required for the construction of Ditches. The Contractor shall construct roadside Ditches using mortared stonework, concrete, reinforced concrete, or precast concrete as shown on the Drawings, unless otherwise directed by the Engineer.

2. MATERIAL REQUIREMENTS

2.1 Materials

The Contractor shall submit to the Engineer, for his approval, details and samples of materials he intends to use for the construction of Ditches included in this Specification Section.

2.2 Bedding

- a) Granular material for bedding shall be in accordance with Paragraph 4.2, Table 4 of Vietnamese Standard TCVN 7570 – 2006 and subject to the approval of the Engineer.
- b) Lean concrete for bedding shall be class C10 bedding or blinding concrete in accordance with the requirements of Specification Section 07100 Concrete and Concrete Structures.

2.3 Mortared Stone

Mortared stonework shall conform with the requirements of Specification Section 04400 Mortared Stonework.

2.4 Concrete

Precast and cast insitu concrete used for all structural work described in this Specification Section shall be of the classes indicated on the Drawings and shall conform with the requirements specified in Specification Section 07100 Concrete and Concrete Structures.

2.5 Reinforcing Steel for Concrete

All reinforcing steel shall conform with the requirements specified in Specification Section 07500 Reinforcing Steel.

2.6 Submittals

2.6.1 Shop and Working Drawings and Schedules

The Contractor shall prepare shop drawings, method statements and a schedule of Ditches showing proposed construction details for the Ditches indicated on the Drawings or as directed by the Engineer. Shop drawings, method statements and schedules shall be submitted to the Engineer for approval prior to the start of any construction works on the Ditches. The Contractor's schedules shall include the location and profile of each length of Ditch. The profiles shall be coordinated with associated drainage features including manholes, catch pits and culverts.

2.6.2 Programming

Construction of Ditches shall not begin until the Engineer has approved the Contractor's shop drawings, method statements and schedules. The Contractor shall allow sufficient time in his Program for the submission and approval of shop drawings, method statements and for any revision and resubmission of such documents that may be required to incorporate the comments of the Engineer.

3. CONSTRUCTION REQUIREMENTS

3.1 Setting Out Ditches

The Contractor shall set out the required locations, lengths, direction of fall, and grades of all Ditches. Setting out shall include locating all associated catch pits and outfalls.

3.2 Roadside Ditches Construction

- (a) The Contractor shall excavate, fill, and shape the Ditches to the grades shown on the Drawings and to the profiles shown on the typical Drawings of Ditches or as otherwise directed by the Engineer.
- (b) For open ditches lined with mortared stone, the Contractor shall remove and dispose of all excavated material on or off the Site. Cast in situ concrete ditches excavation shall conform with the requirements of Specification Section 03200 Structural Excavation. No material shall be left on Site such that it may be washed or otherwise deposited back into the excavation or the completed Ditches.
- (c) Construction of the cast in situ concrete or the mortared stone lining for

Ditches as specified in this Specification Section shall not begin until after the Engineer approves the excavated formation of the Ditches.

- (d) The finish to all Ditches shall be sufficiently smooth and uniform to ensure the free flow of water without ponding during periods of low flow.

3.3 Tolerances, Rectifying and Maintenance

3.3.1 Dimensional Tolerances

Grades of Ditch invert against those specified or ± 5 mm at any point approved

Ditches alignments and the shape of cross sections as ± 2 cm at any point. specified on the Drawings

3.3.2 Rectifying Unsatisfactory Work

- a) All materials and workmanship used in the construction of Ditches shall be subject to the inspection and approval of the Engineer. Where appropriate the Engineer will issue instructions for any remedial work found necessary as a result of unsatisfactory work by the Contractor. The Works will not be approved until such time as they have been completed to the satisfaction of the Engineer.
- b) Remedial work may include but not be limited to:
 - (i) Repetition of survey work defining existing or constructed surface profiles as often as necessary to obtain an accurate record of the physical conditions;
 - (ii) Additional excavation or fill, which could include backfilling new work and re-excavating it to the specified dimensions, lines, and grades, and
 - (iii) Repairing or replacing defective mortared stonework or concrete work.
- c) No additional payment or extension to the Time for Completion granted shall be made for the extra work or quantities expended for rectification work.

3.3.3 Maintenance of Accepted Work

The Contractor shall be responsible for the routine maintenance, cleaning and care of the Ditches until the issue of the Taking-Over Certificate.

4. MEASUREMENT AND PAYMENT

4.1 Method of Measurement

- a) Ditches and french drains shall be measured for payment in linear meters of completed ditch or french drain of each type, measured along the centre line, according to the Drawings or approved shop drawings submitted by the Contractor. No separate measurement or payment shall be made for; excavation, backfill, bedding, lining, cover slabs or maintenance to ditches or french drains. All these shall be deemed to be included in the pay items in this Specification Section.
- b) Cascade drops (not applicable to package 2) shall be measured for payment on the basis of the constituent parts, which together comprise the finished cascade drops. To these quantities of work the applicable unit rates from the applicable Specification Sections set out in Table 1 below shall be applied. No separate measurement or payment shall be made for bedding or maintenance to cascade drops. All these requirements shall be deemed to be included in the pay items identified in Table 1 below.
- c) Median cross ditches (not applicable to package 2) shall be measured for payment according to the number of each type installed according to the approved shop drawings submitted by the Contractor. No separate measurement or payment shall be made for; excavation, backfill, bedding, lining or maintenance to the median cross ditches. All these shall be deemed to be included in the pay items in this Specification Section.
- d) The Ditches provisions, material requirements and construction requirements identified in this Specification Section shall be measured for payment in pay items 04200-01, 04200-02, 04200-07, 04200-08, 04200-10, 04200-28 and 04200-29.
- e) Any Ditches Works not specifically identified in this Specification Section but which are necessary for the performance of the Works shall be deemed to be included in pay items 04200-01, 04200-02, 04200-07, 04200-08, 04200-10, 04200-28 and 04200-29.

4.2 Basis of Payment

- a) The work under this Specification Section, except cascade drops, shall be paid for in accordance with the applicable unit prices as indicated in the Bill of Quantities and given below. Payment shall be full compensation

for performing the requirements of the Contract for the items of work as specified including; all preparatory works, supplying and transportation of materials, excavation, placing and compaction of filling material and for furnishing all labor, materials, tests, tools, equipment and any incidentals to complete the Works as shown on the Drawings and as required in accordance with this Specification Section and/or as directed by the Engineer.

- b) The work under this Specification Section for cascade drops shall be paid for in accordance with the applicable unit prices indicated in the Bill of Quantities of the Specification Sections set out in Table 1 below. Payment shall be full compensation for performing the requirements of the Contract for the items of work as specified including; all preparatory works, supplying and transportation of materials, excavation, placing and compaction of filling material and for furnishing all labor, materials, tests, tools, equipment and any incidentals to complete the Works as shown on the Drawings and as required in accordance with these Specifications and/or as directed by the Engineer.

<u>Pay Item</u>	<u>Description</u>	<u>Unit</u>
04200	Ditches	
04200-01	Toe Slope Ditch, Type CF-400	m
04200-02	Toe Slope Ditch Type CF(E)-400	m
04200-07	Side Ditch, Type CD-400	m
04200-08	Side Ditch, Type SD-600*600	m
04200-10	Side Ditch, Type SD(C)-600*600	m
04200-28	Shoulder Drainage Ditch (at Roadside Slope) Type VCF-400	m
04200-29	Median Ditch (at Superelevation Curve), Type MD-350*400	m