

SPECIFICATION SECTION 08400

BRIDGE DRAINAGE

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SPECIFICATION SECTION 08400 – BRIDGE DRAINAGE

1. DESCRIPTION

This Specification Section prescribes the provision and installation of the Bridge Drainage system. The work shall be in accordance with the Drawings and subject to the approval of the Engineer.

2. MATERIAL REQUIREMENTS

2.1 Reference Standards

The most recent edition of the following Standards shall be applied to the Works covered by this Section.

Vietnamese Standards:

TCVN 5709-1993	Hot - rolled carbon steel for building – Technical requirement.
22TCN 280-01	Welding specification for steel bridge and steel structure
TCVN 6151-1996	Pipes and fittings for water supply Specifications.

International Standards:

ASTM A53	Specification for pipe, steel, black and hot-dipped, zinc coated, welded and seamless.
AASHTO M105 (ASTM A48M)	Specification for gray alloy castings.
ASTM A307	Specification for Carbon Steel Bolts and Studs
AASHTO M 291M (ASTM A 563M)	Specification for Carbon and Alloy Steel Nuts

2.2 Drain Pipes

Pipes and fittings shall be of the sizes and types indicated on the Drawings. They shall comply with the requirements of Vietnamese Standard TCVN 6151-1996.

2.3 Catch pits and Gratings

Catch pits and gratings shall be gray cast iron type with reliability test greater than grade 50 as required by AASHTO M105/ASTM A48M or equivalent Standard for heavy items, of the shape and size and with the connection requirements indicated on the Drawings.

2.4 Fixing Brackets

The materials for fixing brackets shall conform to Vietnamese Standard TCVN 5709-1993 or ASTM A53 and shall be galvanized or of other rust resistant materials and subject to the approval of the Engineer.

Welding shall conform to Vietnamese Standard 22TCN 280-01.

2.5 Bolts and Nuts

- (a) Bolts shall conform to Specification for Carbon Steel Bolts and Studs, 420 MPa Tensile Strength, ASTM A307.
- (b) Nuts for bolts shall conform to either the Specification for Carbon and Alloy Steel Nuts, AASHTO M 291M (ASTM A 563M).
- (c) Nuts and bolts of any assembly shall be galvanized by the same process. The nuts should be over tapped to the minimum amount required for the fastener assembly and shall be lubricated with a lubricant containing a visible dye.

2.6 Water conduct pipe

The water conduct pipe and its catch pits shall be a proprietary pipe system of the diameter indicated on the Drawings and as approved by the Engineer, and shall be applied in accordance with the manufacturer's recommendations.

2.7 Submittals

The Contractor shall submit his method statement to the Engineer for his approval. The method statement shall include but not be limited to arrangements and details of pipes, fittings and joints, means of casting the catch pit into the structure and details of fixing pipe brackets to concrete surfaces.

The Contractor shall submit to the Engineer for his approval manufacturer's certificates confirming that all materials meet the requirements of the relevant Standards and Specification Sections. Certificates are required for; pipes and all pipe fittings, the catch pits and gratings.

2.8 Delivery, Storage and Handling

Materials delivered to Site shall be inspected for damage, unloaded and stored with the minimum handling. Materials shall be handled in such a manner as to ensure delivery to storage or the point of installation in sound undamaged condition. Pipes shall be carried and not dragged. Materials shall not be stored directly on the ground. The inside of pipes and fittings shall be kept free of dirt and debris.

2.9 Installation

Drainage catch pits and gratings shall be installed complete at the locations indicated on the Drawings. Catch pits shall be cast into the structure or cast into a previously formed blockout as detailed in the Contractor's method statement. Where the catch pits are to be cast into a blockout, all relevant details shall be subject to the approval of the Engineer. Where catch pits are secured into blockouts using concrete, the concrete shall be at least equal in strength to the concrete in the surrounding structures and all blockout faces shall be prepared as required for those of the construction joints.

All pipes and fittings shall be installed to the locations, lines and grades indicated in the Drawings. Cutting of pipes shall be avoided. Where pipes are cut, the cut end shall be cleaned and trimmed. All joints shall be properly and securely made to ensure no leakage of water.

All pipe brackets shall be located and securely fixed in place before pipes are installed.

3. MEASUREMENT AND PAYMENT

3.1 Method of Measurement

(a) Catch Pits and Gratings

Drainage catch pits, frames and gratings inclusive of all fittings shall be measured according to the number of complete set of each type, constructed and installed in accordance with the requirements of the Drawings and to the approval of the Engineer.

All costs associated with water conduct pipe and its catch pits shall be considered Indirectly Paid Work and under the applicable Catch Pits unit prices in the Bill of Quantities.

(b) Drainage Pipe

The pipe diameters indicated in the pay item descriptions in the Bill of Quantities are outside diameters. Drain pipe shall be measured for payment in linear metres along the centre line between the intersections of the centre of the pipe for the drain pipes of the diameters and types required by the Drawings. The measurement by linear metre shall include all fixtures and fittings including pipe covers, tees, pipe connectors, brackets and all necessary fittings, supports and accessories indicated on the Drawings or otherwise required. All rates shall include protective coatings, and shall be for all items constructed and installed to the approval of the Engineer.

(c) The Bridge Drainage provisions and material requirements identified in this Specification Section shall be measured for payment in pay items 08400-01, 08400-02 and 08400-03.

- (d) Any Bridge Drainage Works not specifically indentified in this Specification Section but which are necessary for the performance of the Works shall be deemed to be included in pay items 08400-01, 08400-02 and 08400-03.
- (e) The unit rates shall include, inter alia, for all block outs and formwork.

3.2 Basis of Payment

The work under this Specification Section shall be paid for in accordance with the applicable unit prices as indicated in the Bill of Quantities and given below. Payment shall constitute full compensation for performing the requirements of the Contract for the item of work as specified including furnishing all necessary labor, materials, tools, equipment, incidentals and tests.

Pay Item 08400	Description Bridge Drainage	Unit
08400-01	Catch pit, Type 1(Cast Iron)	set
08400-02	PVC Pipe D195mm	m
08400-03	PVC Pipe D225mm	m