

Section 203 - Excavation and Embankment.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
509.11 Structural Plate Pipe	Lump Sum
509.12 Steel Structural Plate Pipe Arch	Lump Sum
509.13 Steel Structural Plate Arch	Lump Sum
509.141 Steel Structural Plate Box Culvert	Lump Sum
509.18 Structural Plate Pipe	Lump Sum
509.19 Aluminum Alloy Structural Plate Pipe Arch	Lump Sum
509.20 Aluminum Alloy Structural Plate Arch	Lump Sum
509.21 Structural Plate Pipe (Steel or Aluminum Alloy Option)	Lump Sum
509.411 Aluminum Structural Plate Box Culvert	Lump Sum

SECTION 510 - SPECIAL DETOURS

510.01 Description This work shall consist of the design, construction, maintenance in good condition, and removal of temporary structures and approaches required for the satisfactory maintenance of vehicular and pedestrian traffic.

Easements or right-of-way for the Special Detour will be furnished by the Department and will be shown on the contract plans. The Contractor may obtain additional easements at no cost to the Department.

510.02 Materials Materials used for the Special Detour structure and approaches shall be approved by the Resident before they are incorporated in the structure and approaches.

510.03 Vehicular and Pedestrian Traffic Not Separated The Special Detour shall be located as close as practicable to the new work or as shown on the plans.

Design and details for the Special Detour shall be furnished to the Resident by the Contractor. The Special Detour including the temporary structure shall be designed and sealed by a Professional Engineer, registered in accordance with the laws of the State of Maine.

The Contractor shall submit detailed plans of the temporary structure and approaches and obtain approval of the Resident before construction. These plans shall be provided in accordance with, and subject to, the conditions of Section 105.7 - Working Drawings. In addition, the design computations relating to the temporary structure shall be submitted for review by the Resident.

Temporary structures shall be designed in accordance with current AASHTO Standard Specifications for Highway Bridges, except as noted herein, to meet live load requirements of MS18 [HS20]. References to Main Load Carrying Members shall mean those members in which the major stresses result from dead load or live load, or both. Secondary Members are those members whose primary purpose is to brace the structure against lateral or longitudinal force, or to brace or reduce the unbraced length of main members, or secondary members.

a. Structural Steel Allowable working stresses for tension, compression, and shear in Main Load Carrying Members and Secondary Members and in Steel Grid Floor or Deck as given in the AASHTO Standard Specifications may be increased 35% except where age or condition of the steel to be incorporated in the temporary structure may be cause for reduced allowable working stresses. Fatigue stresses need not be considered.

b. Deflections Primary structural members shall be designed so that deflection due to live load plus impact shall not exceed 1/300 of the span.

c. Reinforced Concrete Allowable working stresses for concrete in compression (f_c) and reinforcing steel in tension (f_s) may be increased 50% for main load carrying members and floor slabs. Allowable stress in compression for concrete (f_c) shall be limited to the lesser value of $0.6 f_c$ or 12 MPa [1800 psi].

d. Timber Allowable working stresses for extreme fiber in bending (" F_b ") and horizontal shear (" F_v ") may be increased by 50% for use as main load carrying members, secondary members, floor or curb provided that material incorporated in the structure is sound and not subject to excessive checks, splits, knots or other deterioration.

e. Bridge Railing Loads Bridge railing shall be designed in accordance with AASHTO Specifications, except that the

static design load "P" specified as 44.5 kN [10 kips] may be decreased to 22.3 kN [5 kips]. However, allowable design stresses for material used in bridge rails and posts shall not be increased above those allowed by AASHTO Specifications.

f. Waterway Opening The minimum waterway opening of the temporary structure shall be designed to pass the discharge indicated in the Contract Specifications, without any overtopping of the roadway.

The geometric design of the Special Detour, except as otherwise shown on the plans or as noted herein, shall be designed in accordance with the current AASHTO Specification "A Policy on Geometric Design of Highways and Streets".

a. Horizontal Alignment Horizontal curve radius shall not be less than 60 m [200 feet] at the centerline of roadway, except as approved by the Resident.

Roadway width as indicated in the proposal shall be the minimum clear traveled width between faces of bridge curbs. Bridge curb shall be between 150 mm and 225 mm [6 in and 9 in] high. The roadway face of bridge rail shall be located 75 mm to 150 mm [3 in to 6 in] behind the face of curb. The approach roadway shall have minimum 600 mm [2 ft] shoulders to the roadway berms or to the face of approach road guardrail in addition to the roadway width indicated in the proposal.

The roadway width shall be increased on curved portions of the Special Detour to account for the off tracking characteristics of a WB-62 vehicle in accordance with Table III - 20, Case I or Case III of the AASHTO Specification.

b. Vertical Alignment Grades shall not exceed 10% and any change in grade shall accommodate all legal highway vehicle components or attached loads.

c. Approach Road Guardrail The Special Detour approaches shall have guardrail where side slopes are steeper than three horizontal to one vertical. Approach guardrail shall be attached to the bridge guardrail in a manner that develops the approach guardrail in tension. Approach guardrail shall consist of Type 3 guardrail or an approved equal unless other rail or barriers are specified.

The termination of approach guardrail and the end treatment of the rail shall be in accordance with the current AASHTO

Roadside Design Guide.

d. Approach Road Base Drainage The approach road base structure shall consist of a minimum of 300 mm [1 ft] thick layer of aggregate subbase course gravel, Type D or E and the layer shall be designed to support legal loads during the use of the detour. Drainage shall be designed to drain the approach area.

e. Approach Road Surface The approach surface shall be approved gravel, except when specified to be paved, and shall be maintained in a compacted and smooth condition.

f. Design Speed The design speed of the Special Detour shall be not less than the construction area posted speed limit, or the advisory speed limit, as applicable, unless otherwise indicated in the contract specification.

510.041 Pedestrian Traffic Only The provisions of Section 510.03 - Vehicular and Pedestrian Traffic Not Separated, shall apply to this Section with the following modifications:

- a. Structures shall be designed for a live load of 4 kN/m² [85 lb/ft²].
- b. The detour shall have a minimum clear width of 1.50 m [5 ft] or as specified on the contract plans or specifications.
- c. Ramps shall be provided to allow access to wheelchair or handicapped persons.
- d. Deflections due to live load shall not exceed 1/300 of the span.

510.042 Vehicular and Pedestrian Traffic Separated The provisions of both Section 510.03 - Vehicular and Pedestrian Traffic Not Separated, and Section 510.041 - Pedestrian Traffic Only, shall apply to this Section. If vehicles and pedestrians are carried on the same structure, each shall have its own lane as specified. The pedestrian lane shall be protected from vehicular traffic by being at least 225 mm [9 in] above the roadway surface or suitably protected by means of an adequate curb at least 225 mm [9 in] in height above the roadway surface. No bridge rail will be required between vehicle traffic and pedestrian traffic, but shall be located at the exterior side of the sidewalk.

510.051 Vehicular and Pedestrian Traffic Not Separated The Special Detour, including temporary structures shall be constructed in accordance with the plans submitted by the Contractor and approved by the Resident. Barricades, warning signs, lights and other traffic control devices shall be provided in accordance with the project traffic control plan requirements.

Deck and floor members shall be fastened or anchored so that all contact surfaces with adjacent supporting members bear continuously. Immediate corrective action shall be taken by the Contractor to remedy any condition in the structure that results in objectionable or distracting noise levels when subject to traffic loads.

If a wood plank deck is used, it shall be secured into wood nailer strips, or secured by an alternate method acceptable to the Resident.

Provisions shall be made for a skid resistant wearing surface throughout the period of time the temporary structure is open to public travel for vehicular and pedestrian traffic. A steel grid floor may be used for vehicular traffic if installed in accordance with approved design plans and these specifications.

Prior to opening the temporary structure to traffic, the Professional Engineer responsible for the design shall certify in writing to the Department that the structure was constructed in conformance with the approved plans and design details.

510.052 Pedestrian Traffic Only The provisions of Section 510.051 - Vehicular and Pedestrian Traffic Not Separated, shall apply, however, screw type nails will not be required to anchor wood plank for pedestrian traffic use.

510.053 Vehicular and Pedestrian Traffic Separated The provisions of both Section 510.051 - Vehicular and Pedestrian Traffic Not Separated, and Section 510.052 - Pedestrian Traffic Only, shall apply.

510.06 Contractor's Responsibility The provisions of Section 104 - General Rights and Responsibilities, Section 105 - General Scope of Work, Section 107 - Time, and Section 652 - Maintenance of Traffic, shall apply to work under this section. The Contractor shall be responsible for removal of snow from areas provided for pedestrian traffic as well as vehicular traffic in accordance with Section 104 - General Rights and Responsibilities. In addition to normal maintenance, should any part or all of the detour be damaged or destroyed by high water or any other cause prior to opening the highway to traffic, it shall be repaired or replaced by the Contractor without additional compensation.

Erosion control shall be accomplished in accordance with Section 656 - Temporary Soil Erosion and Water Pollution Control. An Erosion Control Plan shall be submitted for approval by the Resident with the plans and details of the detour.

510.07 Removal of Detour When the highway has been opened to traffic, the temporary structure and approaches shall

be removed to or below the streambed or finish ground line and the approaches shall be obliterated and stabilized to original or better than original conditions. The provisions of Section 104 - General Rights and Responsibilities, shall apply.

510.08 Method of Measurement Special detours will be paid by the lump sum.

510.09 Basis of Payment The accepted special detour will be paid for at the contract lump sum price which price shall be full compensation for the respective items, as called for in the contract, designed, constructed, maintained, completely removed and the affected areas rehabilitated and stabilized, including loaming, seeding and mulching.

When erosion control is required due to runoff from the detour roadway surface, erosion control will be paid under applicable contract items. Other erosion control work required for the special detour will not be paid for directly and all costs for such erosion control will be considered included in the lump sum payment for special detour. Traffic control devices, pavement, and dust control will be paid for under the applicable contract items.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
510.10 Special Detour, ___ meter [foot] Roadway Width Vehicular and Pedestrian Traffic Not Separated	Lump Sum
510.11 Special Detour, Pedestrian Traffic Only	Lump Sum
510.12 Special Detour, ___ meter [foot] Roadway Width Vehicular and Pedestrian Traffic Separated	Lump Sum

SECTION 511 - COFFERDAMS

511.01 Description This work shall consist of the complete construction, maintenance and removal of all cofferdams, caissons, cribs and sheeting, and other related work, including dewatering, required to allow for the excavation of