

SECTION 520

TEMPORARY CROSSINGS

520-1.01 DESCRIPTION. For each site where public traffic uses a temporary crossing or a Contractor uses a temporary crossing that is elevated over a public route, construct and maintain the temporary crossing. Remove temporary crossings after use and cleanup the site.

Design temporary bridges, change the preliminary design of approach roads to accommodate temporary bridges, and have an independent design check performed. Inspect and perform quality acceptance on temporary bridges.

520-1.02 DEFINITIONS.

Designer of Record (DOR). A civil engineer registered as a Professional Engineer in the State of Alaska, and in responsible charge of the work described. The DOR must have adequate and relevant prior bridge design and inspection experience. The DOR may delegate portions of design, quality acceptance, and inspection work, to qualified technicians. The DOR and qualified technicians must be in a separate command structure from the Contractor's temporary crossing superintendent and work crew.

Independent Engineer (IE). An engineer registered as a Professional Engineer in the State of Alaska, and in responsible charge of the independent design check. The engineer responsible for the check must have adequate and relevant prior bridge design experience. The engineer responsible for the check shall not be employed by the Contractor or the same firm as the Designer of Record; or employed by a firm managed or owned by the Contractor or the Designer of Record; nor shall the engineer performing the work manage or own the Contractor or the firm employing the Designer of Record.

Independent Design Check (IDC). An independent design check of the temporary bridge package including but not limited to: design, location and dimensions of the foundation, structural members, connections, erection plan and temporary bracing (when required), safety barrier, and independent calculations of design loads, member stress, material properties, hydraulic capacity and scour protection.

Temporary Bridge. A temporary bridge used by the public or over a public route, including abutments, piers, safety barrier and railing, foundation scour protection, and other incidentals.

Temporary Bridge Package (TBP). Design calculations, working drawings, specifications, and all items identified on Form 25D-080, for a temporary bridge.

Temporary Crossings. A detour route that includes temporary bridges, approach roads and other incidentals.

MATERIALS AND DESIGN

520-2.01 MATERIALS. New or used materials must meet the requirements of the design and the Contract. The DOR must verify in writing the quality of temporary bridge materials before incorporation into the project.

520-2.02 GEOTECHNICAL DATA AND HYDROLOGY REPORT. The Department may provide records of geotechnical investigations. The Contractor is responsible for obtaining all additional geotechnical data necessary for design and construction of the temporary crossings.

The Department may provide a preliminary hydrology and hydraulics report. The Contractor is responsible for obtaining all additional hydrology and hydraulics data necessary for design and construction of the temporary crossings.

520-2.03 TRAFFIC CONTROL PLAN. Submit a traffic control plan for temporary crossing according to the Plans and Section 643.

520-2.04 DESIGN REQUIREMENTS. Retain the services of a DOR to design temporary bridges, and to provide a TBP. When the temporary bridges are used as a construction platform for the Contractor's equipment or workers, then design and construct temporary bridges that are wide enough for traffic lanes and construction areas, and strong enough to support design traffic and construction loads.

The Department will provide preliminary designs for approach roads. The DOR may change the design of approach roads to accommodate temporary bridges.

1. Design temporary crossings according to the following documents:
 - a. *DOT&PF Standard Specifications for Highway Construction* for recommended material properties, and sampling and testing frequencies and methods.
 - b. *AASHTO LRFD Bridge Design Specifications* for temporary bridge design criteria, as modified by Subsection 520-2.04; and
 - c. *DOT&PF Preconstruction Manual* for design criteria for changes to approach roads.
2. Provide working drawings for temporary bridges including:
 - a. All information and details necessary to construct temporary bridges including all items listed in Form 25D-080;
 - b. All dimensions controlling the temporary bridge design and erection, including beam length and spacing, post location and spacing, vertical distance between connections in diagonal bracing, height of bents, and similar design controlling dimensions;
 - c. All design loads and material properties;
 - d. The soil bearing values;
 - e. The openings required to allow the passage of traffic, including horizontal and vertical clearances, and the location of railing or barrier;
 - f. Water design flow, opening size and elevations under superstructure, the high water elevation, and the maximum water flow elevation, and vertical clearances; and
 - g. When a bridge is built over a traveled way show where temporary bracing is used during erection or removal of the bridge, show the sequence of erection and removal, and show details of the temporary bracing used.
3. Design temporary bridges to conform to the following requirements:
 - a. To support 100% of HL-93 live loads or the Contractor's maximum construction load whichever is greater, without overstress. Follow the most recent version, including interim version, of *AASHTO LRFD Bridge Design Specifications*. Indicate governing live load on working drawings;
 - b. Design for half the seismic acceleration value of the permanent bridge shown on the Plans;
 - c. Include the capacities and demands of load-supporting members in the design calculations;

- d. Provide a clear roadway width of not less than 24 feet and a clear pathway width of not less than eight feet on the temporary bridge. Construct the temporary bridge and approach embankments wide enough to safely pass contractor's equipment during all phases of constructing the new bridge. Provide additional width for construction equipment if you use the temporary bridge as a work platform during the same time that the roadway and pathway are being used by the public;
 - e. Design vertical clearance for the life of the temporary structure. A minimum vertical clearance of 18'-6" feet is required above the road. A minimum vertical clearance of 17 feet is required between the low elevation of the superstructure and (1) the ordinary high fresh water or (2) mean high salt water elevation of navigable waters;
 - f. Minimum clearance of one foot between the low elevation of the superstructure and the maximum water flow elevation within your proposed construction opening. Calculate the design water discharge for each temporary bridge;
 - g. To support equipment used to install and remove the temporary bridge, and construct or renovate the existing bridge. List equipment type, size, capacity, lifting locations, and traffic patterns during lift on the working drawings. Indicate maximum construction loads and locations of applied construction loads;
 - h. Provide a railing or barrier system on the bridge and bridge approaches that is anchored to prevent deflection when impacted by an errant vehicle. Railing or barrier system to consist of either concrete jersey barrier (prohibited on construction site after 01/01/08) or concrete F shape barrier. Pin concrete barrier to the deck so the outside edge of concrete barrier is setback 12 horizontal inches from the outside edge of deck;
 - i. Provide a roadway surface made of concrete, asphalt, timber, or steel deck;
 - j. Design to comply with the requirements of all permits and environmental commitments, including time windows during which work may occur. Apply for and obtain additional permits or modifications to existing permits as needed;
 - k. Do not use existing bridge components on the project site for temporary bridge construction;
 - l. To support loads from utilities identified in the Contract;
4. Design changes to approach roads must conform to Department design criteria and permit requirements.

520-2.05 DESIGN SUBMITTAL AND REVIEW. Comply with the following:

- 1. Retain a DOR to design temporary bridges and design changes to the approach roads. The design drawings in the TBP must be stamped with the seal of, dated by, and signed by the DOR;
- 2. Retain an IE to perform an IDC; and to stamp with their seal, date, and sign an IDC letter certifying: "The TBP meets the AASHTO LRFD Bridge Design Specifications and the Contract requirements"; and
- 3. Submit the IDC letter with three sets of the TBP (except calculations may be one set), and with three sets of design changes to the approach roads, to the Engineer for review and approval at least 30 days prior to anticipated date of beginning construction of the temporary bridge.

520-2.06 VALUE ENGINEERING. Base your bid on supplying temporary bridge structures according to the Contract documents. After Award you may submit construction value engineering proposals to the Engineer. Proposals must include permitting requirements and timelines for construction. The Department will consider value engineering proposals according to Subsection 104-1.06.

CONSTRUCTION

520-3.01 TRAFFIC MAINTENANCE. Protect and control traffic according to Section 643 and the approved traffic control plan.

520-3.02 CONSTRUCTION REQUIREMENTS. Construct temporary crossings entirely within the right-of-way and within permitted areas. Construct according to the approved TBP. Construct according to the Standard Specifications for Highway Construction with exceptions noted by the DOR and this Section 520.

Bolted steel connections must use load indicating washers. Weld according to Subsection 504-3.01.8 Welding.

Maintain structure and wearing surface of temporary crossings until substantial completion. Maintain temporary bridges in a safe and functional condition. Keep bracing and connections tight, and immediately replace any damaged members or damaged connections. Promptly remove debris caught against, under or inside, temporary bridges.

Limit surface deviations to 3/8 inch, as measured from the testing edge of a 10-foot straightedge, between two contacts on the driving surface of the temporary crossings.

520-3.03 WINTER MAINTENANCE. The Department may accept the crossing for winter snow and ice removal only; but the Contractor is responsible for repairs and maintenance caused by the Department's snow and ice removal, or as required for any other reason.

520-3.04 INSPECTION. The Contractor is responsible for Quality Control, and the construction of temporary crossings, including temporary bridges and approach roads, to conform to the working drawings, specifications and the Contract requirements.

The DOR is in responsible charge of Quality Acceptance and inspection, of temporary bridge materials and construction work. The DOR must verify in writing that the quality of bridge materials meet the design and Contract requirements. The DOR or qualified technician, is required to be on-site and to inspect critical work including but not limited to abutments, piers, pile driving, welding, structural elements, fastening of structural elements, reinforcing steel placement, concrete pours, and foundation scour protection.

The Engineer may sample and test materials, and may reject materials that do not meet the requirements of the design. The Engineer may inspect the construction of temporary crossings at any phase of construction and reject unacceptable work. The Engineer will inspect the finished construction of temporary crossings before public use; however, inspection by the Engineer will not relieve the Contractor from any responsibility for defective work.

520-3.05 APPROVALS. Obtain the following written approvals from the Engineer:

1. Temporary bridge package prior to beginning temporary bridge construction;
2. Design changes to temporary approach roads prior to construction of approach roads;
3. Temporary bridge construction prior to opening the bridge to traffic; and
4. Approach road construction prior to opening the road to traffic.

Such approvals will not relieve the Contractor of the responsibility for defective work. The Contractor shall remain responsible for all aspects of the design, location and dimensions of the temporary crossing, including but not limited to the foundation, structural members, connections, safety barrier, and for the satisfactory construction of all work.

The Engineer's review and approval of the TBP shall not be construed as a complete review, but will indicate only that the general method of construction and working drawings are acceptable to the Department, that the TBP appears complete, and that a certification of an IDC was provided.

The request to open the temporary bridge to traffic must be supported by a final inspection report that is stamped with the seal of, dated by, and signed by the DOR; and that certifies: "The temporary bridge has reached Substantial Completion as defined in Subsection 101-1.03, conforms to the requirements of the TBP and the Contract, and can support design traffic loads and construction loads, and is suitable for public use."

520-3.06 CLEANUP. Remove temporary crossings, cleanup site, and stabilize site from erosive forces before final completion. Return the site substantially to its original condition. Additional cleanup conditions may be listed in the permits. Remove piling to one foot below ground level.

520-4.01 METHOD OF MEASUREMENT. Section 109.

520-5.01 BASIS OF PAYMENT.

Temporary Crossings. The contract price includes all design, engineering, inspection, labor, equipment and materials necessary to furnish, install, repair, maintain and remove temporary crossings in their entirety. The price does not include traffic control and traffic maintenance.

<u>Pay Item</u>	<u>Pay Unit</u>
520(1) Temporary Crossings	Lump Sum