



Construction & Materials Tips

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No Slipforming on the T4 Bridge Rail Parapet

The T4 bridge rail, currently available as bridge standard drawings at <http://www.dot.state.tx.us/insdot/orgchart/cmd/cserve/standard/bridge-e.htm>, is designed and crash-tested to meet Test-Level 3 requirements of National Cooperative Highway Research Program (NCHRP) Report 350 for high-speed use:

- The T4 rail is 33 in. high, and it includes a lower 18-in. high concrete parapet and a top metal member.
- The T4(S) has a flattened elliptical steel tubular top rail.
- The T4(A) has a half bullet-shaped extruded aluminum top rail.

Significant impact forces are resisted by these top rails, their posts, and the threaded anchors that are embedded into the top of the concrete parapet. These top rails are crucial to the crash performance of the T4 rail.

Numerous contractor proposals to slipform the T4 rail concrete parapet aim to speed construction and open projects to traffic in less time. However, the proposals all include schemes to place the anchors in a manner that does not permit the anchors to achieve their design strength. Examples include:

- Slipforming the parapet and drilling and grouting the bolts in later—This approach is unacceptable because the pullout cone of the drilled-and-grouted bolts intersects the face of the parapet and the bolts cannot achieve the required pullout resistance.
- Tying the bolts to the rebar cage and slipforming the concrete—This approach is unacceptable because the stiff concrete causes many of the bolts to lean over, raising concerns about the consolidation of concrete around the bolts.

To encourage faster construction without negative effects on performance, the Bridge Division has developed and tested a new version of the T4 rail parapet that will allow optional slipforming. The new rail will be called the T401 and is shown in Figure 1. It will have a thicker parapet (12-1/2 in.) three in-line proprietary epoxy adhesive anchors per post that will be cored into the cured concrete parapet. Support for the current T4 rail standard drawing will be withdrawn when new T401 rail standard drawings are published in the near future.

Until the new T401 standard is first specified in the field, the T4 remains the current version. **For the T4 bridge rail on TxDOT projects, slipforming of the concrete parapet is not permitted.**

For TxDOT projects currently under construction that specify use of the T4 rail, the Bridge Division will provide on request a sealed working drawing sheet for T401 details. This change order should be executed at little or no additional cost.

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Figure 1. Prototype T401 Bridge Rail

For more information on slipforming of the concrete parapet of the T4 bridge rail, contact Mark J. Blosscock, P.E., (512) 416-2178; or Brian D. Merrill, P.E., (512) 416-2232. For more information on development of T401 standard drawings, contact John Holt, P.E., (512) 416-2212. ****

TxDOT Partnering Program

Partnering is a common sense, results-oriented, Value-Engineering business strategy, bringing together stakeholders (i.e., members of the transportation community and industry including the traveling public, cities, towns, other states and countries, resource agencies, contractors, consultants, businesses, adjacent property owners, state, national, and international economy, and TxDOT) to build a foundation for success. This strategy values shared goals, integrity, open communication, fairness, innovation, identifying issues (Rocks-in-the-Road), collaborative problem solving, and timely dispute resolution. The Partnering program's ultimate goals are a safe project, completed on time, within budget, resolve disputes in a timely manner, and free of claims. Utilized to support TxDOT's core functions of planning, design, construction, and maintenance, Partnering is a vehicle for meeting our current and future business needs.



TxDOT has conducted over 800 Partnering meetings on projects amounting to over \$10 billion since beginning in 1992. TxDOT Partnering streamlined and changed its focus from a process-oriented approach to one of results. Partnering sessions must meet the needs of all stakeholders.

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Factors to consider in determining the need and scope of Partnering on any given project are:

- trust and respect between the contractor and TxDOT
- contractor experience: How much experience does the contractor have in this type of project?
- contractor Partnering experience
- project complexity
- costs (road-user costs, incentives/disincentives, performance bonus, etc.) and schedule factors of the project
- coordination requirement for the project
- subcontractor involvement
- traveling public and political involvement and concern
- uncontrollable influences (utilities, organizations, resource agencies, cities, counties, etc.) upon the project
- TxDOT personnel level and quality of Partnering experience
- previous and current experience (including Partnering) between the office of project responsibility and this contractor. Are there any previous or on-going claims or disputes with this contractor which may influence this project or resource availability?
- other factors identified and/or considered important by the DE/DD/OD.

Partnering is addressed in the Construction Contract Administration Manual, Chapter 3, "Post-Award Activities," and Special Provisions 000-2169 (1993) and 000-878 (1995). Partnering is not a substitute for items in the plans, specifications, or contract. For more detailed information about Partnering, Partnering Facilitators, arranging a Partnering session, and current Partnering Program Guidelines, go to: <http://crossroads/org/hrd/quality/partnering/0Home.asp>.

Effective September 1, 2003, the Construction Division (CST) is the Office of Primary Responsibility for TxDOT's Partnering Program. The Partnering Program is located in the Labor & Contract Administration Branch of the Construction Section. Please contact Elizabeth Boswell, P.E., at (512) 416-2456 or Renee Frisinger at (512) 416-2482, if you have questions or comments regarding the Partnering Program. ****