

To: Igor Kharitonoff
Bill Zellmer

Date:
9/27/05

From: Tom Hale

Subject: El Camino Replacement Hospital
SMRF Connection Design
HS032809

I have reviewed the final SlottedWeb™ Moment Connection Testing Report, Project No. #31140-2, Report No. L-05-2971 by the Smith Emery Laboratories dated September 16, 2005 for Seismic Structural Design Associates, Inc. and agree that the test results meet the Special Moment Resisting Frame (SMRF) connection testing requirements of the current 2001 CBC for this project and are in close agreement with the SMRF Connection Testing Protocol dated January 2005 (Rev. March 2005) which was approved by OSHPD on March 28, 2005. This testing included both a W14 column and a deep wide flange column (W27).

To substantiate the connection for those similar SMRF beam and column member sizes not tested, a design methodology must be established. For that purpose, as an interim, the ES Report ER-5861 issued May 1, 2002 entitled "SlottedWeb™ Beam to Column Steel Moment Frame Connection" and published by the ICBO Evaluation Service, Inc. should be used to design the moment connection with the following further limits and conditions.

1. The maximum beam depth and weight when used with a W14 column shall not exceed a W36x393.
2. The maximum beam depth and weight when used with a deep wide flange column shall not exceed a W36x256.
3. The minimum beam span length (measured centerline to centerline column) shall not be less than 20 feet with moment connections at each end, unless the span-to-depth ratio is great than or equal to 8, and in no case should the span length be less than 17'-10" for this particular project.
4. The material used for beams shall meet the requirements of ASTM A992, or A572 Grade 50 when it meets the physical and chemical requirements of A992.

5. The material used for columns shall meet the requirements of ASTM A992, or A572 Grade 50 when it meets the physical and chemical requirements of A992 and, in addition, ASTM A913 Grade 65 may be used for columns.
6. The material used for plates shall meet the requirements of A572 Grade 50.
7. Bolts shall be ASTM A325.
8. The roughness of all thermal-cut surfaces shall be not greater than an ANSI surface roughness of 1000 micro-inches.
9. Lateral bracing of the columns at connection level is required and on the beam at intervals as required by AISC Seismic 97, Section 9.8 with Supplement No. 2.
10. Panel zone strength shall meet the requirements of AISC Seismic 97, Section 9.3 with Supplement No. 2.
11. The shear plate thickness shall not be less than $\frac{2}{3}$ of the frame beam web thickness.
12. Continuity plates with a thickness equal to the frame beam flange shall be provided through the column. Those continuity plates shall be welded to the column flanges and web using double bevel Complete Joint Penetration (CJP) welds with a $\frac{5}{16}$ " reinforcing fillet weld. Welding of the continuity plates shall avoid the k-area of the column where possible.
13. After welding of continuity plates and doubler plates, test column webs for cracking using liquid penetrant or magnetic particle testing over a zone 3 inches above and below the continuity plate or doubler plate welds that cross the k-area. Testing shall be performed after the weld has cooled to ambient temperature.
14. The CJP welds used to connect the beam flanges to the column flange shall be constructed using E70T-6 electrodes.
15. Run-off tabs for the top and bottom CJP beam flange welds shall be removed. The back-up bar for the bottom flange weld shall be removed, but the top beam flange weld back-up bar may remain. A reinforcing fillet weld shall be added beneath the top and bottom flanges equal in size to $\frac{1}{4}$ of the beam flange thickness, but not less than $\frac{1}{4}$ ", nor more than $\frac{3}{8}$ ".
16. The shear plate and beam web shall be connected to the column flange using CJP welds and E71T-8 electrodes.

17. Interpass temperature for welds shall not exceed 550 degrees F.
18. In addition to a fillet weld, shear plates shall be attached to the beam using 1" diameter A325 bolts at 4-1/2" on center maximum with 3" edge distance and 2-1/2" minimum edge distance. The bolts shall be tensioned to AISC specifications and require special inspection.
19. Welding Sequence: Both flanges shall be welded prior to any supplemental welding to the shear tab.
20. OSHPD shall review and approve all WPS/PQRs for the connection.
21. Significant axial load on the SlottedWeb™ connection due to collector or chord forces is beyond the scope of this approval.
22. The SSDA standard connection details and notes, specifically modified to conform with the above requirements, shall be placed on the structural drawings.