Winter , 2006

The Track Guy NEWSLETTER

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Track Rehab, Salem Branch, NJ

1.	Railroad Construction, SJ	2,920,000.
2.	Railworks Track Systems	3,400,000.
3.	Rhinehart RR Const.	4,360,000.

Morrisville Yard, Phase II

1.	Slattery Skanska	97,900,000.
2.	Conti Enterprises	102,700,000.
3.	Prismatic	103,000,000.

Track Guy Consultants

We had a very successful trip around the country giving our Trackwork 101 seminar. We were overwhelmed by the positive feedback and thoroughly enjoyed speaking to so many people. So far we have spoken to 300 people represented by 76 different companies. We had some good discussions on whether rail in embedded track needs to be thermal adjusted in Phoenix and what to do about the heat affected zones in both field welds and flash butt welds. One of our biggest turnouts was in Dallas with 44 people in attendance. On Veterans Day in San Diego we got a surprise visit from my father and uncle, both World War II veterans. The response to our seminars has inspired us to develop more training programs, which we hope to unveil in the spring. We will be putting together 6 more 1-day seminars and over 45 modules that a customer may pick and choose what they want in their learning experience. The course titles we envision are:

- Trackwork 101 (an overview) 1-day
- Trackwork 102 (advanced theory) 1-day
- Trackwork 103 (Foreman's training) 1 or 2 days
- Trackwork 104 (FRA Track Safety Standards) 2 days
- Trackwork 105 (Methodology) 1-day
- Trackwork 106 (Standards for Passenger Track) 1-day
- Trackwork 107 (Project Management) 1-day

These courses or a custom built training program combining the modules will be made available in the spring. John also wants to write a book that would take about a year. We will keep you posted and if anything interests you drop us a note or give us a call. Thanks to everyone for their support.

Notes:

VTA awards Wong/PB the design phase of the BART extension to Milpitas, San Jose & Santa Clara.

Parsons Brinckerhoff is awarded the CM portion of the Tukwila LRT project for Sound Transit. A 5-mile double track project.

Granite/Schiavone is awarded the $261,000,000 project for the rebuild of the South Ferry Subway by the NYCT.

An Editorial

By John Zuspan

Every once in awhile, I like to reflect on the experiences that have changed my life and my career and since it is the end of a year it felt appropriate at this time. During the last 31 years of working on the Railroad, I have seen some changes in the industry, some good and some bad. The attitude towards work in general has changed and it is more difficult to find hard working dedicated people that want a life on the Railroad filled with lonely times traveling, hard back breaking work around a dangerous environment. We worked in the rain, the snow, the hot and the cold. Some of us went through a couple wives or so. All for practice when we find the right one. Drive spikes all day, drink all night and do it again. Swing a spike maul till our hands bleed, but never let the boss know how much you hurt. Work Holidays, weekends and nights. My first 6 years in New York was working nights and weekends in the New York subway. I had no social life and bars that opened at 6am where a blessing. My skin was turning yellow from lack of sunshine. I had to give up the drink and did find a wife who has put up with me for 22 years so far. The worst job on the Railroad for me was tamping or dressing track with a shovel. Playing the banjo (hand tamping) sucked. Later as I climbed the ladder, the stress became more exhausting than the physical labor. The late nights developing plans and strategies, all the time hoping they work. Scheduling, organizing and playing the mind games with the workers were a true challenge. I used to keep track of the excuses and one guys mother died 5 times. Would I trade any of this? Never in a million years. Satisfaction and self reward are what drives me. I was very fortunate to find an industry that I truly love, early in my life. There are too many people that hate their jobs. When the first train rides over a piece of track that I helped build, is a feeling that can not be expressed in words. When a plan comes together and is executed perfectly or when a project comes in under budget, the feeling can not be expressed in words. When an idea works and continuity is achieved, the feeling can not be expressed in words. When the designer says "WOW, I don't know how you built this, but it did look good on paper" or when you drive the last spike or clip, the feeling can not be expressed by words. I think you get the point. Building track is a unique trade and one that not many people know about. The comradory and teamwork are sometimes overwhelming to the point of tears. I also am very grateful to have worked my way up the food chain and am extremely grateful for those mentors that took me under their wing. I know that I am preaching to the choir. Let us all be a mentor and help the young buck and doe to continue to be a part of this great industry. The rail industry is full of very good people and I am proud to be associated with them. We must continue to grow ourselves and teach others to take our jobs.

Ask The Track Guy

This is where you, the reader get to ask questions about Railroad Track engineering, design, construction, maintenance or anything to do with Trackwork. Simply write or e-mail a question and we will answer in a timely manner. Some questions will be published here.

How do you determine the Neutral Temperature?

The definition of neutral temperature is the temperature at which the rail is neither expanding nor contracting. There are a few terms that mean the same, such as "Preferred Rail Laying Temperature" (PRLT) or "Zero Stress Temperature" (ZST) or "Stress Free Temperature" (SFT) or "Rail Neutral Temperature" (RNT) or "Desired Rail Temperature" (DRT) and probably some more. Neutral Temperature is different from region to region and from owner to owner. It is generally accepted within the industry to lock the rail down at a temperature that is higher than the calculated neutral temperature. The reasoning is that a train has a better chance of negotiating a pull apart than a "sun kink" (track buckle, as per FRA). It also takes more force (about 900,000 lbs) to cause a pull apart than a track buckle (about 350,000 lbs). The formulas for determining neutral temperature are:

$$\text{Min DRT} = \frac{2H_t + L_t}{3} + 10$$

$$\text{Max DRT} = \left[\frac{2H_t + L_t}{3} + 25\right] \pm 5$$

Where: H_t = Highest **Rail** Temperature
L_t = Lowest **Rail** Temperature
DRT = Desired **Rail** Temperature

The research for temperatures must go back 50 years. If there is no data, then the highest recorded ambient temperature for your region must be acquired from the weather bureau, then add 40° to get the highest rail temperature and use the lowest as recorded by the weatherman.

How much stress is in the Rail?

In our Winter 2005 Newsletter we talked briefly about these forces when the question was asked "What does rail do when it gets hot or cold and where do the forces go". We will get more detailed on this one. Stress in the rail is determined by a simple formula that is based on the change in temperature the cross section of the rail and a constant. This means that the bigger the rail, the more stress that needs to be controlled. The formula is:

$$F_{orce} = K \bullet A \bullet \triangle T$$

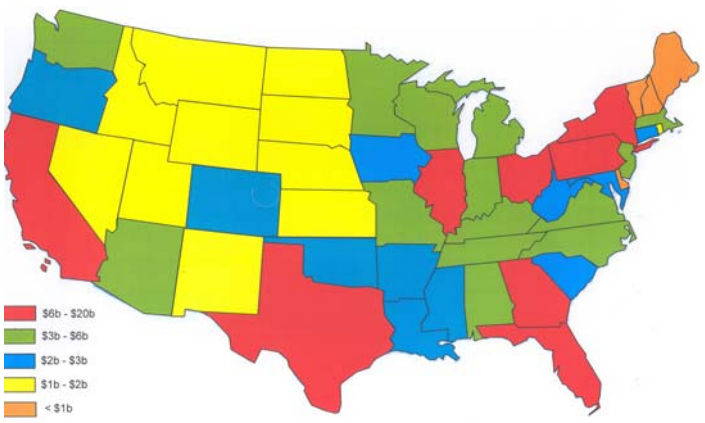
Where:
K = 200 lbs/in^2/°F
A = X-section of rail (in^2)
$\triangle$T = Change in Neutral (°F)
F_{orce} = Force (lbs)

X-section of some Rail
100RE = 9.84 in^2
115RE = 11.2465 in^2
132RE = 12.9124 in^2
136RE = 13.3263 in^2
140RE = 13.6675 in^2

Remember that this is force and not pressure. If you run some numbers, you will see that we are in the range of 1-ton of force per degree of change. If we continue this analysis, we come up with *about* 19.60 (a good year) pounds of force for every 1-pound of rail for every 1° of temperature change.

Believe it or not.

Some Details on SAFETEA-LU



The map above shows the distribution of the Transportation Bill's money. This represents total funding levels ($286.4b), not just Transit. The Transit funding is $52.6b. Since we have had a Transportation Bill (1992), transit funding levels have increased steadily from ISTEA ($24.1b, 1992-1997), TEA-21 ($36b, 1998-2003) and now SAFETEA-LU ($52.6b, 2004-2009). The rest of the discussion will only pertain to the $52.6b. It is broken into 5 basic categories and each category contains subcategories.

Basic Categories	
Formula Programs	$ 28,484.6m
Capital Investment	$ 22,692.9m
Planning	$ 559.9m
Research	$ 373.8m
FTA Operations	$ 510.9m

There are a total of 24 Sub Categories.

Other Sub Categories within the basics	
Urbanized Areas—Formula Programs	$ 22,183.2m
High Density States—Formula	$ 1,695.0m
Rural Areas—Formula	$ 2,186.5m
Clean Fuels—Formula	$ 288.1m
Job Access, Reverse Commute—Formula	$ 851.5m
Fixed Guideway Modernization—Capital	$ 8,486.7m
New Starts—Capital Investment	$ 9,339.9m
Buses—Capital	$ 4,866.3m
Metropolitan Planning	$ 463.2m
TCRP Research	$ 54.3m
National Research	$ 243.9m