

Track Training Programs

for the
Railroad Industry
Standard and Custom Built Seminars

Presented by
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Introduction

Track Guy Consultants has designing specific training modules and full length training courses that will be offered to persons that have an interest in the rail industry. We are in the midst of a renaissance pertaining to rail transportation, whether it is related to the freight or passenger industries. Railroad Track is being constructed all over the globe in urban and rural areas. Light Rail in particular has double it's trackage in the last 5 years and new transit agencies are sprouting up at a rate of 1 per year. The Freight arena is at over capacity and in dire need of expansion. More efficient means of transporting goods and reducing maintenance time and cost is absolutely a necessity. Intermodal is a word that is still not in the dictionary, yet is a hot topic in the industry and intermodal facilities are in varying stages of design and construction. The people doing this work are overworked and some are still designing and building the track using outdated information. The new generation of Railroaders needs to be trained and motivated in order to continue to produce a first class rail network. The experienced Railroader can always use a refresher and their participation in class is of great value. We can help with all your training needs whether it is in a classroom setting or field instruction. We start each seminar with a brief monolog about John Zusan's career in order for the attendee to understand who is giving the instructions.

Please check your needs below and we will design a custom Training program just for your Company. Return the completed form to us for a complete estimate with options. We furnish a Certificate of Completion and a wallet size laminated card stating that the attendee has been "Track Guy Trained". A manual containing the presentation is given to each attendee.

Full one or two day Training Seminars

These are full day training courses that are already designed to include specific modules in order to bring a category of topics to the attendee. They have certain degrees of intensity and some require prerequisites.

1. Trackwork 101[©] (An Overview) (1-day)

- a. This course is designed for the person that wants a general overview of Railroad Track construction and design. We touch on every possible subject that pertains to the Railroad and discuss these topics in a broad sense, keeping the discussion on a high level and leaving the detailed learning to a later time. This seminar has been widely accepted in the industry and is a great starter for any training program. Some of the topics covered are a discussion on the History of Railroad Track, how to make rail, definitions, fasteners, other components, types of Track and technical discussions on Wheel/Rail interface, load transfer, thermal forces, welding rail, determining rail life, track geometry, under balance, design criteria, jerk rate, economics of track, FRA rail & track defects, FRA Safety Standards, AREMA recommendations, APTA Safety recommendations, very brief methodologies and procedures for constructing Ballasted Track and DF Track, stray current, OTM, hand tools and equipment. We also show a video of track construction, equipment and some safety tips. This course is accredited for 8-CEU's by the Engineering Institute.

2. Trackwork 102[©] (Advanced Theory) (1-day)

- a. This seminar requires a good understanding of track design and construction as well as the terminology that applies to the rail industry. This is an extension of the Trackwork 101 seminar. This is where we go much deeper into the topics and explore some of the theories that apply to the Railroad Track. We will use examples and lessons learned to explore and maybe challenge some of the theoretical process as it may pertain to newer technology and materials.

3. Trackwork 103[®] (Forman's Training) (1-day)
 - a. This course is designed with the track supervisor and foreman in mind. We teach techniques for building and maintaining the track structure. We bring some of the theory into play to help the student have a better understanding as to why we do the things we do. We discuss many topics such as : how to build a turnout and set the guard rail properly, the proper way to thermal adjust CWR, string lining curves, how to make a field weld, material handling, setting up a flash butt welding plant, techniques for changing ties and rail. Sighting track for surface and line, organizing and planning the work and, more to be developed.
4. Trackwork 104[®] (FRA Track Safety Standards) (1 or 2-day)
 - a. This is a 1 or 2-day training course that focuses on the latest standards that the Federal Railroad Administration requires for any trackage that is connected to the general railway system. We discuss inspection of track and can spend a day in the field looking for defects and following up on the proper reporting procedures. We also review many of the topics that pertain to Freight Track and Maintenance of Way.
5. Trackwork 105[®] (Methodology) (1-day)
 - a. We talk about how to build the different types of track such as ballasted track, DF track, embedded track and the different variations of each. We use all our experiences to learn from each other. We bring many lessons learned to the seminar. We use video as a means of explanation. We keep this class very informal and share everyone's experiences so we can do it right the first time. Problem solving is a big part of the seminar and when others express a real life problem, we will take the time and solve that specific problem or situation. Learning from others mistakes is the ultimate learning experience. How to properly do a Highway Railroad Crossing is discussed as well as understanding how to do one half at a time. We also offer Safety and Planning tips.
6. Trackwork 106[®] (Standards for Passenger Track) (1 or 2-day)
 - a. This seminar follows the guidelines as set forth by APTA and discusses all safety standards for Transit, and Light Rail Track. This follows the same format as the FRA Track Safety Standards but adds more topics as it pertains to passenger transportation, such as 3rd rail and catenary. This is a relatively new standard to the industry and is not accepted throughout the industry but is an excellent standard to build on and customize to each property. This class should be a must for all those responsible for the safe passage of trains with people on them. At the end of the class we will offer a letter to the Transit Agency identifying the attendees as having the knowledge and understanding to perform Track Maintenance and Inspection while at the same time holding John Zuspan harmless.
7. Trackwork 107[®] (Project Management) (1-day)
 - a. This seminar will take us through the entire process of a project and how to manage all the activities along the way. We will use our 30⁺ years of experience in managing projects as a foundation and keep the classroom in an open discussion forum in order to solve problems that others may have encountered. We focus on managing a Track Project whether it is contracted as a subcontract or as a general contract. We will discuss the original idea, procurement methods, pre-qualification, the estimate, the award, the schedule, the execution, cost controls, claims & delays, litigation, final acceptance, final payment and close-out. We will discuss how to protect your rights and how to keep impeccable records as well as the importance of document control and communication. All these and many more topics will be discussed with the ultimate goal of turning a profit in mind. After all we are not charitable organizations.
8. Trackwork 108[®] (Custom Training) (1-day or more)
 - a. This is a custom made program for any corporation. You choose the topics and we will design the course. Simply choose from the modules below or make up your own using the approximate time as a guide for the overall length for a Training session. Typically we come to you for this one.

Training Modules

These are detailed modules that a customer can choose from. They each have a specific topic and by combining these modules we will make a custom training program. Approximate times are given for each module and some require certain knowledge of Railroad track design, construction or maintenance. NOTE: More detail can be added to each topic and therefore the approximate times may vary depending on the degree of difficulty that the customer would like to see.

1. The History of Railroad Track (20 min)
 - a. We trace the history of Railroad Track from the mid 17th century to today's structure. We discuss the 8 innovations that produced the track structure, showing the increase and decrease of trackage through the years and how we transport people and commodities. We also give a brief history of Metropolitan rail showing examples and the creativity of the inventor's. We offer an explanation as to why the gage is 56½" and why rail is measured in three foot increments as well as why a tie is 8'6" long.
2. Rail and how we make it (20 min)
 - a. A detailed discussion on how rail is made using the continuous casting method with a brief talk on the open hearth and blast furnace methods. We show the meanings of all the nomenclature that is stamped onto the rail and show the technical terms to identify the design of the rail. We show some very important milestones in the production of rail.
3. Definitions (20 min)
 - a. A discussion about the language of the railroad and what the specific terms that are used. We use photographs and sketches to help explain each definition.
4. Fasteners (20 min)
 - a. We show the many different types of fasteners and discuss why some have failed and offer new innovations that have come into the market. This is an open discussion and opinions and experiences are encouraged.
5. Types of Track (20 min)
 - a. We show the basic types of track and talk about variations within each. We will briefly talk about some lessons learned and some that have failed.
6. Specialwork details (20 min)
 - a. We explain how to determine the frog number. We discuss the geometry of a turnout and show the correct way to set a guard rail. We get into the workings of a double slip and discuss all the components and what they do.
7. Wheel/Rail Interface (15 min)
 - a. We begin this topic with an explanation of the 6 basic forms of rail transportation which comprise the 3 categories of our rail network. This is essential for understanding load transfer and the 3 degrees of force that are imposed on the track structure. We further explain the wheel rail dynamics and show the proper orientation of rail and wheel. We give examples on what not to do and share some anecdotal remarks.
8. Load Transfer (15 min)
 - a. We carry a single wheel load in the static condition from top of rail to the sub-grade and show the pressures along the way. We do freight and light rail loading. We stay in the static condition a give a brief explanation when the dynamic forces are imposed onto the track structure, leaving the details to advanced theory. We further show the importance of tie spacing and ballast depth.
9. Thermal Forces (20 min)
 - a. We explain how to control the thermal forces and explain the importance of shoulder and crib ballast as well as the holding force of the ballast under the tie. We show a couple examples and give limits of force that the track structure can handle. We show how to calculate these forces as well as the gap required for a specific rail temperature. We also

give examples of what to look for when walking track to determine if the neutral temperature may be too low or too high.

10. Welding Rail (field & flash) (15 min)

- a. We explain the difference between the two as well as show the heat affected zones and what this means to proper testing and interpretation of contract specifications. We discuss the procedures for both types of welds.

11. Rail life (10 min)

- a. We offer a simple equation to determine the life expectancy of rail using some older formulas and challenge the audience to think about the development of some newer ones.

12. Curves (20 min)

- a. Explains the anatomy of a curve and explains the meaning and importance of spirals. We show how to do string lining and create a graph to determine defects. We show how to calculate radius and middle ordinate.

13. Clearances (10 min)

- a. We briefly show the importance of clearances on the railroad and how a car body reacts to the changes in alignment and surface.

14. Unbalance (20 min)

- a. What it means and how we deal with it. Examples are given and calculations are offered to determine if the design is within certain limits. We show how to distribute the superelevation in order to achieve good rider comfort. This is a general overview and can be made more detailed.

15. Design Criteria (10 min)

- a. We present some basic design criteria and show how each property owner may vary.

16. Jerk Rate (10 min)

- a. A general discussion on what it is and how it relates to rider comfort. We go through a couple examples and show what to look for and determine if there is an issue with alignment as it relates to Jerk Rate.

17. Economics of Track (15 min)

- a. This is a discussion about how much it costs to build railroad track. We keep this open for discussion and offer basic pricing for Ballasted Track, Direct Fixation Track and Embedded Track with 3 degrees of difficulty per type.

18. Rail & Track Defects (15 min)

- a. This is a brief discussion and general overview of some rail defects and the limits imposed by the FRA. Detailed version is in Trackwork 104.

19. FRA Standards (15 min)

- a. This is a brief discussion and general overview of geometry defects and the limits imposed by the FRA. Detailed version is in Trackwork 104.

20. AREMA recommendations (15 min)

- a. This is a very brief discussion of the AREMA manual and shows the comparison between the FRA and APTA standards.

21. APTA recommendations (15 min)

- a. This is a brief discussion and general overview of some rail defects and the limits imposed by the APTA standards for passenger rail. Detailed version is in Trackwork 106.

22. Building ballasted track (20 min)

- a. We go through the general methodology of constructing ballasted track with an explanation on how a tamper works. This is a brief discussion and can be presented in much more detail with plenty of conversation. More detail is offered in Trackwork 103 and 105.

23. Building DF track (20 min)
 - a. We go through the general methodology of constructing direct fixation track with an explanation on top down construction. This is a brief discussion and can be presented in much more detail with plenty of conversation. More detail is offered in Trackwork 103 and 105.
24. Building embedded track (20 min)
 - a. We go through the general methodology of constructing embedded track with an explanation on top down construction. This is a brief discussion and can be presented in much more detail with plenty of conversation. More detail is offered in Trackwork 103 and 105.
25. Building Specialwork (20 min)
 - a. We go through the general methodology of constructing a turnout the right way. This is a brief discussion and can be presented in much more detail with plenty of conversation. More detail is offered in Trackwork 103 and 105.
26. String Lining (10 min)
 - a. This is a lost art in the industry since we now have geometry cars and computer operated roller gages, but this will give the student an understanding of how to string line a curve and go through the trial and error method of making corrections.
27. Project Management (abbreviated) (60 min)
 - a. This is a quick discussion on Managing a track project, showing the different activities that must be watched in order to protect the bottom line and maintain efficiency. A much more detailed approach is in our Trackwork 107 seminar.
28. CWR maintenance (60 min)
 - a. This covers the means and methods of maintaining and controlling CWR. We go deeper into the theory and offer hands on examples for calculating gap and stresses. We discuss the proper way to distress rail and the dos and don'ts of working with CWR. This discussion could be lengthier with a field walk.
29. Stray Current (30 min)
 - a. This discussion offers the basics of stray current and the importance of good quality control. It is not meant to be an in-depth talk but will give the student a much better understanding of how it all works.
30. Maintaining Track (60 min)
 - a. This is a brief discussion on maintaining track. How to plan maintenance and prioritize the defects. Offers some methodologies on changing rail, ties and ballast. How to maintain turnouts, crossings and joints. More details can be in Trackwork 103 & 104.
31. Inspecting track (60 min)
 - a. This is a more in-depth discussion of the FRA Safety Standards and gives the student a better understanding of what to look for when walking track or inspecting a turnout. Photos are shown and a discussion is encouraged about what may be wrong. This would be the middle approach between #19 and Trackwork 104
32. The track structure as it works together (60 min)
 - a. This topic shows the track structure and talks about how it all works together and gives examples of what happens if a certain component may be missing. We give examples of material and discuss the properties. We further give the student names of vendors and briefly discuss their products and how they relate to the track structure.
33. Tools (30 min)
 - a. This is a discussion about hand tools and how they work. We offer some safety tips as to how to use them and show the right tool for the job. This can be followed by some safety videos and manufacturers recommended procedures.

34. Equipment (30 min)
 - a. We show the different types of equipment and what they do. Possibly showing some promotional videos to help explain their function. This is not intended to explain how to operate the equipment, just offers the purpose.
35. Roadbed (30 min)
 - a. A detailed discussion of the roadbed and how important it is to have a good foundation. We show the pressures that are involved and explain how it all works together. More details are in our Trackwork 103 presentation
36. Ties (30 min)
 - a. We talk about the different types of wood and different materials used in producing railroad ties. We offer advantages and disadvantages of each and stress the importance of using the right product for the application in order to save money over the long term. We do some life cycle cost analysis and compare.
37. Ballast (30 min)
 - a. The different types of ballast are discussed and where they should be used. We discuss handling and load transfer, showing the pressures and interaction with the other components. We show some new products and talk about how they can save money.
38. Rail (30 min)
 - a. This is the most costly asset of the track and we talk about ways to prolong life of the rail and do proper rail management. We discuss the many methods of maintaining rail and how important that each are to the bottom line.
39. Joints (20 min)
 - a. New FRA criteria have surfaced for inspection of joint bars for the prevention of derailments. We talk about this and show the loads that joint bars are expected to carry. We further talk about the proper maintenance and care of joints and what bad joint maintenance can do to a railroad track structure.
40. Gage, Alignment & Surface (60 min)
 - a. Tight gage, wide gage, wiggles and dips can be very detrimental to the track structure. We talk about finding, prioritizing and correcting defects in gage and alignment, as well as surface. We explain proven techniques to correct surface and discuss how to sight the rail and use string lines and lasers.
41. Drainage (60 min)
 - a. This is a topic that can't be discussed enough. It has proven to destroy a track structure in a short period of time. We will emphasis the importance of drainage and show methods for correcting poor drainage. The more you wait, the more it costs.
42. Replacing Rail (30 min)
 - a. We offer an interactive discussion on replacing rail and some of the dos and don'ts as well as some Indian tricks. It is recommended that competing companies not attend the same discussion.
43. Crossings (60 min)
 - a. How to build one (half/half or full). The importance of the excavation and the compaction as well as the finish running surface for both the railroad and rubber tired vehicles. We will show the dynamics of both and offer some solutions.
44. Vegetation Control (30 min)
 - a. Controlling vegetation is very important to both the track guys and the operation guys. Visibility is extremely important for safety of the general population and organics in the track structure can degrade any track.
45. Derailments (30 min)
 - a. We will briefly discuss derailment investigation and prevention. This is not a comprehensive discussion but will give the student a better understanding of what to look for before and after a derailment.

46. Other Stuff (20 min)
 - a. This is a category that catches the stuff that we missed in other modules. We add to this as newer technology is unveiled in the industry. We will explore some ideas that may be considered strange or not conforming to the industry standards.
47. Statistics (20 min)
 - a. We show some facts and statistics about the Rail industry and look at some possible trends as it pertains to Track. We look at how the industry has become more efficient and streamlined and then we ask the question: Have we lost some of the foundation that this industry was built on?
48. Weights and Measures (15 min)
 - a. We will explain some common weights of track material and equipment. We will also show a program for doing easy conversions and calculations for activities on the Railroad such as determining neutral temperature, number of ties per mile etc.
49. Training the next Generation (20 min)
 - a. These modules talk about the differences between the generations and what motivates each one. We also discuss how to mix and match generations and the do's and don'ts when managing the different generations.
50. Lessons Learned (20 min)
 - a. We offer some mistakes that have been made over time and suggest some solutions
51. Safety (30 min)
 - a. Safety is a predominant factor in all forms of work and the risks are great in the rail industry. We show some safety DVD's and discuss certain tricks of the trade that help workers to be safer on the job. We focus on hand tools, power tools and working around equipment.
52. Vendors (20 min)
 - a. Manufacturers, vendors and suppliers are discussed as to what they make or distribute to the rail industry. We offer some opinions based on our 33 years of dealing with suppliers. We show where you can get some competitive pricing and offer some rough budget numbers.

Simply fill in this form and get it back to us for a quotation. Thank You

Company Name	
Contact Person	
Address	
Phone Number	
e-mail address	
Expected Date(s) for Training	
Location of Training (City)	
Expected # of Attendees	
List Module numbers you want:	
Will you be furnishing the Facilities? YES NO	

Please furnish any other information that may be pertinent, such as specific categories you may want that are not listed.

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