24 Construction

List of Figures

24.1 Contractor Safety

Contractors directly employed by BNSF who will be performing work activities on BNSF property within 25 feet of the centerline of the track are considered "roadway workers." These contractors must follow the procedures outlined in Engineering Instruction 1 Safety, specifically section 1.3.3.

24.1.1 Roadway Worker Protection/On-Track Safety Program and Training

The contractor must develop this program and training. He or she should complete the Contractor Orientation Website by visiting: www.contractororientation.com. Each field employee must complete this orientation.

The contractor must ensure that subcontractors, or other service providers he or she may use, are properly trained if the employees will be within 25 feet of the centerline of the track.

24.1.2 Training Certification

Every contractor, subcontractor employee, and service provider must have a card that is properly signed and dated certifying that they have received roadway worker training. See Figure 24-1.

Certificate of Safety Training

This certifies that _____ , employed

By _____ has received

Safety training through his/her employer, as indicated.

Trainer's Signature: _____

This Certification Card Must be in Your Possession While on Duty on BNSF Property

Always know your location and be able to direct emergency responders.

BNSF Informational
24-Hour Emergency Phone Number
1-800-352-5452

- ❑ Asbestos _____ _____
- ❑ Hazardous Waste _____ _____
- ❑ Hazards Communication _____ _____
- ❑ Hearing Conservation _____ _____
- ❑ Respiratory Protection _____ _____
- ❑ Personal Protective Equipment _____ _____
- ❑ Bridge Worker Safety _____ _____
- ❑ Fall Protection (Other) _____ _____
- ❑ Confined Space _____ _____
- ❑ Lockout/Tagout _____ _____
- ❑ Excavation _____ _____
- ❑ DOT Training _____ _____
- ❑ On-Track Safety _____ _____
- ❑ Lookout _____ _____
- ❑ Lone Worker _____ _____
- ❑ BNSF Contractor Orientation _____ _____
- ❑ _____ _____ _____
- ❑ _____ _____ _____
- ❑ _____ _____ _____

❑ Note: The above information is included on a fold-out card.

Figure 24-1. Certificate of Safety Training

24.1.3 Contractor Safety Briefing Card

Contractor and subcontractor employees also should have in their possession a copy of the contractor safety briefing card. See Figures 24-2a and 24-2b.

Contractor Safety Briefing Card

(includes all non BNSF personnel)
Revised 5/01/98

Job Safety Briefing:
Before beginning any task, a complete job safety briefing will be conducted with all individuals involved with the task, and again if the task changes. If the task is within 25 feet of any track, the job briefing must include the BNSF flagman.

All contractor employees will receive safety instruction from the contractor's safety officer or a qualified BNSF representative prior to the start of any project.

Contractor's supervision will review the safety guidelines contained in this briefing card to familiarize their employees with safety issues that exist when working in a railroad environment. This should be reviewed at least weekly, and immediately with any new employees(s) coming on the job. It is the responsibility of the contractor's safety officer to instruct employees on these guidelines and to require their compliance.

Housekeeping:
Good housekeeping is of the utmost importance in the prevention of accidents, injuries, and fires. Clean-up will be conducted on a daily basis.

Personal Protective Equipment:
All contractor employees working on BNSF property will be required to wear OSHA approved safety glasses with side shields, hard hats with a high visibility, orange cover and above the ankle, lace up, safety toe boots, with a defined heel. Office employees restricted to office work will not be required to comply. Reflective vests are required in certain locations as specified by the BNSF representative in charge of the project. During inclement weather, proper clothing to protect against frostbite, etc. will be worn. Particular attention to footing and the use of proper footwear are essential when working in snow or other slippery conditions. Hearing protection, fall protection, and respirators will be worn as required by state and federal regulations.

Fouling Tracks:
Train or equipment movement should be expected on any track, in any direction, at any time. Work will not be performed at less than 25 feet from the centerline of any track without a BNSF representative present, unless track is protected by track bulletin and work has been authorized by the BNSF representative in charge of the project. Do not walk between rails or foul tracks, except when duties require and proper protection is provided. When necessary to cross tracks, look in both directions and keep a minimum of 25 feet from the nearest end of stationary rail equipment. Do not crawl under or between rail cars. Under certain conditions, trains and equipment can approach without being heard. Proper attention and protection are essential to personal safety when working near railroad tracks.

Work Protection:
If work protection is provided, **every** employee must know:

1. Who the BNSF flagman is and how to contact him, 2. Limits of the work protection, 3. The method of communication to stop and resume work, 4. Entry into work limits when designated.

Note: Men or equipment entering work limits that were not previously job briefed must notify the flagman immediately and be given a job briefing if working less than 25 feet from the centerline of track.

Riding on Equipment:
Riding on rail equipment is prohibited unless authorized by the BNSF representative in charge of the project.

Damage to BNSF Property:
Any damage to BNSF property will be reported immediately to the BNSF representative in charge of the project. Any vehicle or machine contact with a track, signal equipment, or structure (bridge) could result in derailment and is to be reported by the quickest means possible to the BNSF representative in charge of the project or the respective System or Network Operations Center. Emergency numbers are to be obtained from the BNSF representative in charge of the project prior to the start of any work and posted at the job site for the duration of the project.

Passing Trains:
When a train is approaching, men or equipment working at less than 25 feet from the centerline of track will stop work and move as far away from the track as practical until the entire train has passed. This assures the train engineer that the train has been seen and it is safe to proceed. Failure to do this could result in the engineer placing the train into emergency, which could result in damage to the train and delay to railroad traffic. After notification by the BNSF flagman that no other trains are within the working limits, work may then resume. Note: Some projects may require a different procedure. In these cases, the BNSF representative in charge of the project will advise the contractor of the proper work procedure adjacent to passing trains. Violent arm, flag, or flashlight movement while trains are passing indicates an emergency (requires train to stop) and must not be done unless an emergency exists. NEVER stand with your back to a moving train. Metal banding and other components sometimes break during shipment and can swing out several feet from the train.

Stepping or Sitting on Rails:
Stepping, walking, or sitting on the top of a rail is prohibited. The rail head becomes very slick from oil build up and presents a slipping hazard.

Environmental:
No contaminates are to be discharged on BNSF property. Should it occur, it must be reported by the quickest means possible to the BNSF representative in charge of the project (this includes oils, diesel fuel, gasoline, etc.).

Excavation:
Excavating on the right of way could result in damage to buried cables resulting in delay to railroad traffic. Before any excavation commences, contact the BNSF signal and track representative in charge of the area. All underground and overhead wires are to be considered HIGH VOLTAGE and dangerous until verified with the company having ownership of the line. It is the contractor's responsibility to notify any other companies that have underground utilities in the area before excavating. All excavation will be protected as required by the BNSF representative in charge of the project and backfilled as quickly as possible.

Reporting:
Any personal injury sustained by a contractor employee while on BNSF property must be reported immediately (by phone mail if unable to contact) to the BNSF representative in charge of the project. The injury report form provided by BNSF is to be completed and sent by fax to the address indicated on the form, no later than close of shift on the date of injury.

Weekend/After Hours Work:
When contractor employees are required to work on BNSF property after normal working hours or on weekends, the BNSF representative in charge of the project must be notified. When necessary to work during these times, a minimum of two employees is required to be present. This could be a BNSF employee with a contractor employee or two contractor employees. Exceptions must be approved by the BNSF representative in charge of the project. Any work performed at less than 25 feet from the centerline of track must be protected by a BNSF flagman or by a qualified lookout.

Operation of Vehicles and Equipment:
Equipment and vehicles must operate at a safe speed being aware of operating conditions as well as other equipment and men working in close proximity. Vehicles left unattended must be secured so as to prevent unexpected roll away. Extreme caution must be exercised at all grade crossings.

When in Doubt, Take the Safe Course.

Figure 24-2a. Side 1 of Contractor Safety Briefing Card

Job Briefing Guidelines

Safety, Quality, and Productivity are the result of well-planned and conducted job briefings.

STEP I Plan the Job Briefing

Develop your own work plan by:

1. Reviewing work or task to be accomplished.
2. Checking the job location and work area.
3. Breaking the work or task down into step-by-step procedure.
4. Determining tool, equipment, and material requirements.
5. Determining what safety rules or procedures are applicable.

Consider existing and potential hazards that might be involved as a result of:

1. Job and weather conditions.
2. The nature of the work to be done.
3. The job location.
4. The tools, equipment, and materials used.
5. Equipment to be worked on.
6. Traffic conditions and visibility.
7. Time of day.
8. Safety or personal protective equipment required.

Consider how work assignments will be made.

1. Group assignments
2. Individual assignments
3. Abilities and experiences of individuals

STEP II Conduct the Job Briefing

Explain work or task to employees.

1. What is to be done.
2. Why it is to be done.
3. When it is to be done.
4. Where it is to be done.
5. How it is to be done.
6. Who is to do it.
7. What safety precautions are necessary.

Discuss existing or potential hazards and ways to eliminate or protect against them.

Make definite work assignments.

1. Make sure employees understand assignments.
2. Ask “how” and “why” type questions.

If special tools, materials, equipment, or methods are to be used, make sure employees know how to proceed safely.

Issue all instructions clearly and concisely; check to see that they are understood.

STEP III Job Brief for Special Conditions

Complex jobs.

1. Brief only a portion of the job.
2. Give additional briefing as the job progresses.

Change in job conditions—when it becomes necessary to change plans and procedures as the job progresses, brief employees on these changes. (For example, the weather condition changes.)

STEP IV Follow up By Supervisor

It is important that frequent checks be made as the job progresses to be sure that:

1. Your plans are being followed and correct work methods used.
2. Each person is carrying out the assigned responsibilities.
3. Any hidden hazards have been identified and action initiated to eliminate or what precautions are required.

STEP V Individual Responsibility

All employees are responsible to see that the work plan is carried out according to the Job Briefing or modified when conditions change.

Supplement to BNSF Contractor Safety Briefing Card

All provisions to the Safety Briefing Card dated revised April 28, 1998 remain in effect.

Fouling Tracks:
Work cannot be performed within 8 feet of the nearest rail of any live track without first providing for positive protection for men and equipment.

Note that current instructions do not require a Form B, or positive protection, for any work to be performed with 25 feet of any track. If a BNSF employee is present and the contractor’s operations will not be within 8 feet of the nearest rail, work can proceed with lookout protection being provided by the Railway’s employee.

A Form B, or positive protection, should be obtained whenever the contractor’s operations may result in his equipment or men entering within 8 feet of the nearest rail. This would include the case where a crane was being used, where if the boom on the crane dropped, it could land within 8 feet of the nearest rail of a live track. Positive protection must be secured for the crane to operate.

If a continuous fence is erected 10 feet or more from the nearest rail of the live track, the contractor may continue work until the train approaches “headlight visible or ¼ mile away.” All work is to be stopped until the train has passed the work site. A Form B, or positive protection, will not be necessary unless high speed, heavy equipment is being used, or as is stated elsewhere. The continuous fence must be constructed with the fence fabric being at least 4 feet in height and properly supported such that it remains vertical and is clearly visible. An appropriate footing order is to be issued for notice to train crews if this fencing is left in place overnight.

There may be some operations performed by the contractor’s forces that neither a Form B, other positive protection, or fencing is necessary. In these cases, the BNSF Construction Manager shall first discuss these instances with the flagmen involved. The BNSF Construction Manager will then at the job briefing with contractor forces and flagmen outline how the protection will be provided by the flagmen, acting as lookouts, and any other steps necessary to be implemented for the work to proceed.

Passing trains:
If a train is stopped on a track, work can only be performed that is beyond 8 feet of the nearest rail of the track the train is on. No work within 8 feet of the nearest rail can be performed.

BNSF 24-Hour Emergency Phone Number:
1-800-832-5452

Be prepared to give BNSF milepost location, division, and subdivision.

Figure 24-2b. Side 2 of Contractor Safety Briefing Card

24.1.4 Contractor General Safety Requirements

The BNSF Project Manager should provide contractors a copy of these requirements if they were not provided as part of their bid package.

Safety is important in performing the services under the Company's contract. The Company does not assume the control or responsibility of the contractor to provide safe working conditions for the contractor's employees or subcontractors in requiring the contractor to follow the Company's general safety requirements. The contractor must comply with Federal and State laws and government regulations, including those related to Track Work Protection when working around tracks.

Work near railroad track is dangerous. The contractor and its employees, subcontractors, persons not under railroad contract, and invites are governed by the following safety rules and general safety requirements while on Company property. The contractor must enforce these rules and requirements. The Company has the right to bar the contractor, its employees, subcontractors, persons not under railroad contract, and invites from working on Company property if the company believes they are acting in an unsafe manner.

Safety rules cannot be all-inclusive. Workers must refrain from unsafe and improper practices, including violations of written rules and regulations, and rules of common sense.

1. Do not use alcoholic beverages, intoxicants, narcotics, marijuana, or other controlled substances when subject to duty or have them in your possession or use them while on duty or on Company property. Workers must not report for duty under the influence of any alcoholic beverage, intoxicant, narcotic, marijuana, or other controlled substance, or medication, including those prescribed by a doctor, that may in any way adversely affect their alertness, coordination, reaction, response, or safety.
2. Do not participate in scuffling, horseplay, practical jokes, and conduct of a similar nature.
3. Immediately report to the Engineer all vehicle accidents resulting in damage to Company property.
4. Do not have in your possession firearms or other deadly weapons, including knives with a blade longer than 3 inches, while on duty or on Company property, unless you are authorized to have them to perform your duties, or you have been given special permission.

5. Practice good housekeeping to prevent accidents, injuries, and fires. Clean up daily.
6. Do not leave tools or work materials in close proximity to tracks.
7. Do not throw waste, garbage, bottles, refuse, or other such materials on Company property. Dispose of them only at designated locations. Each contractor will provide refuse containers at the work site and empty them daily.
8. Do not leave objects that could cause a slipping or tripping hazard in walking areas.
9. Do not have open fires or fires in barrels on Company property unless appropriate permits are acquired.
10. In all cases, use the established route of travel in and about the property.
11. Railroad vehicles have an unquestioned right-of-way in circumstances relating to work on or about the track area.
12. Do not wear or use anything that impairs vision or hearing. Listening to personal radios or players is prohibited while on duty.
13. All contractor employees working on Company property will be required to wear the following:

    Note: Office employees restricted to office work will not be required to comply.

    - OSHA-approved safety glasses with side shields
    - Hard hats
    - Above-the-ankle, lace-up, safety boots with a defined heel
    - High visibility retro-reflective orange vests.

    During inclement weather wear:

    - Proper clothing to protect against frostbite (Pay particular attention to footing and the use of proper footwear.)

    When required by State and Federal regulations, wear:

    - Hearing protection
    - Fall protection
    - Respirators
14. Become familiar with and be capable of recognizing railroad equipment adjacent to the tracks.

15. Do not walk, step, or stand on rails or ties, or sit on any part of the track structure except when performing duties.

    Note: The term "track structure" means the space between the rails and within 8 feet outside the rails, unless otherwise specified.

16. Do not tamper with switches or other railroad equipment unless it is necessary for work operation and only in the presence of an authorized railroad worker.

17. Do not go underneath rail cars. Do not occupy rail cars except when performing duties.

18. Do not cross tracks by crossing over or between cars that are coupled together.

19. Do not attempt to catch onto or ride any moving railroad equipment, even though it may be moving slowly.

20. Do not take refuge from rain, heat, etc., under or in cars or other rail equipment.

21. Be aware that trains, locomotives, or cars may be expected at any time, on any track, in either direction. Watch for and keep clear of such movements. Especially be on the lookout for approaching trains:

    - When working in multiple track territory
    - When field of vision is limited
    - When noisy equipment is in use

    A designated person may use a portable air horn to warn workers of approaching trains or equipment. Under certain conditions, trains and equipment can approach without being heard.

    For personal safety, pay attention and use proper protection when working near railroad tracks.

22. Do not work on the track, between tracks in multiple track territory, or nearer than 25 feet to the track without proper flag protection provided by the Company, unless the track is protected by track bulletin and work has been authorized by the Company.

23. When work is within 25 feet of the rail, without consideration to height, stop it in the clear to acknowledge approaching and passing trains.

24. Perform work in tunnels, on bridges, and on overpasses according to a safety plan agreed upon by the Engineer or a representative before work begins in these areas. When working in tunnels, meet specific requirements and work under the Company's supervision.

25. Do not wave arms or objects violently, except in an emergency. This waving is a STOP signal.

26. Do not make movement toward an approaching train or operate machinery in a manner that would cause the Engineer to believe that the track is going to be fouled.

27. Do not cross tracks immediately in front of moving objects.

28. When necessary to cross a track, look both ways and keep at least 25 feet from the nearest end of stationary rail cars.

29. Operate machines across tracks only at established grade crossings. If you must do so at any other location, obtain the permission of and be supervised by the Engineer or a representative on site.

30. Be aware that some rails are conductors of electrical current and are integral parts of the railroad's operating system. Do not lay across rails any devices that could shunt this electrical current. Do not leave hand or portable tools on the rails at any time. Use a wooden lath to provide separation when making measurements adjacent to the tracks.

31. Do not leave machines or vehicles unattended with the engine running. If you leave a machine unattended, leave it in gear with the brakes set. If it is equipped with a blade, pan, or bucket, lower it to the ground.

32. When leaving machinery and equipment on the right-of-way, leave it inoperable and secured against movement.

33. When leaving work-site areas at night and over weekends, leave the areas in a condition that will ensure that railroad employees who might be working in the area are protected from all hazards. Securely cover open pits or holes and place a physical barrier such as a fence around the opening.

34. Do not store or temporarily leave machinery or equipment near a highway grade crossing so that it interferes with the sight distances of persons approaching that crossing. Before beginning work, the contractor, with concurrence of the Engineer or his representative on site, will establish a storage area.

35. Do not cut or knock down trees or move rocks and other materials that might fall on the track structure or on communications or power lines, unless you have the approval and supervision of the Engineer or a representative.

36. Do not create and leave a condition at the work site that would interfere with water drainage.

37. The contractor must provide safeguards and safety signs and keep them in place and in good condition.

38. If you are in charge of a work party, be familiar with the milepost location where the work is being performed so that in case of emergencies you can give the exact location to Company personnel.

39. In cases of emergency, it may be necessary for the contractor's employees or agents to flag and stop approaching trains. Flagging equipment should consist of red fusees and/or red flags.

40. When emergency flagging is necessary, workers should protect against trains moving in both directions.

41. If required to perform emergency flagging, understand that a moving train requires a great distance to stop. The railroad flagger must be at least 1.5 miles from the point being protected to provide minimum distance for the locomotive Engineer to stop the train. Give a stop signal as follows:

    - Swing the lighted fusee or red flag at right angles to the track. (However, the Engineer will recognize the stop signal if given violently in any manner from a point near the track.)

    - When giving a stop signal, do not stand on or within fouling distance of the track. Normally the Engineer will not have the required stopping distance to stop short of the point where the signal is being given.

42. When an emergency exists or if a hazard is noticed on passing trains, immediately notify the Engineer or a representative on site.

43. For emergency communications between crews, use high frequency radios (not CBs).

44. Do not operate radio transmitters when located less than 250 feet from blasting operations.

45. When you must create a hazardous condition while performing work on or in the vicinity of a track, provide proper protection according to a safety plan submitted to and approved by the Engineer or a representative. Provide protection *before* creating the hazardous condition, as well as take any other precautions that may be necessary to protect the condition.

46. Before excavating, the contractor must determine if there are underground electric wires, cables, or pipe lines in the vicinity. Excavating on the right-of-way could damage buried cables, delaying railroad traffic. Before beginning any excavation:

    - Contact the BNSF signal and track representative in charge of the area.
    - Consider all underground and overhead wires HIGH VOLTAGE and dangerous until verified with the company having ownership of the line.
    - Notify any other companies that have underground utilities in the area before excavating.

    If during excavation, soil conditions indicate that there may be contamination (either a change in color or an aroma), stop work and contact the BNSF Project Manager, who must notify the BNSF Environmental Remediation Project Manager. Also refer to section 16.14.

47. If encountering obstructions that do not appear on drawings, immediately notify the Engineer before continuing excavation in the area. If the obstruction is a utility, and the owner of the utility can be identified, then immediately notify the owner as well.

    If there is any doubt about the location of underground cables or lines of any kind, do not perform work until the exact location has been determined. ***There will be no exceptions to these instructions.***

48. Shore all excavations, regardless of depth, where there is danger to track structure or personnel.

49. Do not leave an excavation uncovered or unprotected overnight. Backfill all excavations as soon as possible.

50. When not working on holes or trenches in the vicinity of the track, cover, guard, and protect them.

51. When excavations, trenches, or pits on or adjacent to public roads are not in use, physically protect and denote them using highway barriers with flashing lights.

52. Consider all power line wires dangerous and of HIGH VOLTAGE unless informed to the contrary by proper authority.

    - For lines rated 50 KV or below, maintain a minimum clearance of 10 feet between the lines and any part of the equipment or load.

- For lines rated over 50 KV, maintain a minimum clearance between the line and any part of equipment or load of 10 feet plus 0.4 inches for each 1 KV over 50 KV.
- If the capacity of the line is not known, maintain a minimum clearance of 20 feet.
- Designate someone to observe clearance of the equipment and give a timely warning for all operations when it is difficult for an Operator to maintain the desired clearance by visual means.

53. Ensure that all work over water meets State and Federal regulations.
54. When contractor employees are required to work on Company property after normal working hours or on weekends:
    - Notify the Company representative in charge of the project.
    - Do not work alone during the times specified above. A minimum of two employees is required to be present. This could be a Company employee with a contractor employee or two contractor employees.
55. Operate equipment and vehicles at a safe speed, being aware of operating conditions and other equipment and persons working in close proximity. Exercise extreme caution at all grade crossings.

In all cases of doubt or uncertainty, take the safe course.

24.1.5 Safety Action Plan

The BNSF Project Manager must secure a copy of the contractor's Safety Action Plan before the contractor can start working.

The Safety Action Plan should include the following information:

- Recent Accident History/Goals
- Employee Training
- Emergency Preparedness Plans
- Job Safety Briefings
- Work Practice/Facility Assessments
- Safety Communications Plan
- Process for Addressing Safety Issues

24.1.6 Best Practices Assessments

BNSF Project Managers should regularly interview contractor employees to verify that they clearly understand the safety rules and what kind of track protection they are using on their particular project. Use the "Best Practices Assessment Form" to assist in this process. See Figure 24-3.

BNSF RAILWAY

ENGINEERING SERVICES
BEST PRACTICES ASSESSMENT FORM

BNSF/CONTRACTOR ASSESSMENT

Date of Assessment:			Contractor Assessed: (Company name)		
Assessment Performed by:			Project:		
No. Assessed: BNSF ( ) CONTRACTORS ( )			Location:		
	YES	**NO**		**YES**	**NO**
Orientation Completed:	( )	( )	***Protection:*** (if applicable)		
Card in Possession:	( )	( )	Type (1-flagman, 2-lookout, 3-lone worker, 4-other) _____		
Personal Protective Equipment:			In compliance:	( )	( )
Safety Glasses with Side Shields:	( )	( )	Knows limits of protection:	( )	( )
Lace-up Safety-toed Boots:	( )	( )	Know Flagman's name & how to contact:	( )	( )
Hard Hats:	( )	( )	Knows "SAFETY ZONE" distance:	( )	( )
High Visibility Wear – (vest, hat cover, etc.):	( )	( )	Knows proper flagman signals:	( )	( )
Safety Briefing:			***Contaminates***: (detected at job site)	( )	( )
Received Job Briefing for current task:	( )	( )			
Knowledge:					
Knows when to expect train movement:	( )	( )	***Fuel and Oil Storage:***		
Knows what is required when in doubt:	( )	( )	Properly stored & labeled:	( )	( )
Knows when to report an injury:	( )	( )			
Knows speed a vehicle is to be operated:	( )	( )	(CHECK ONE) ***Housekeeping***: ____Good ____Fair ____Bad		
Knows who to notify is Railroad damaged:	( )	( )			

The Contractor pursuant to the terms of its Contract shall remain solely responsible for full compliance with all safety requirements imposed by the Contract including OSHA, FRA and any other applicable laws and regulations. Nothing in this assessment is intended to relieve Contractor from such responsibility.

Comments: *(Name – BNSF or Contractor, Position – Failure Description)*

_____

_____

_____

Revised: March 1, 2005

Figure 24-3. Best Practices Assessment Form—Engineering Services

When an employee cannot correctly answer or otherwise "fails" an assessment, a copy of the assessment form should be given to the contractor's Job Superintendent. The BNSF Project Manager should maintain a record of all assessments during the course of the project.

BNSF flaggers are an integral part of a safe project, so they must properly understand the construction activities they are protecting. BNSF Project Managers also should regularly interview the flaggers to verify their knowledge and understanding. Use the "Safety Assessment Form—BNSF Flaggers" to assist in this process. See Figures 24-4a and 24-4b below.

When a BNSF flagger cannot correctly answer or otherwise "fails" an assessment, a copy of the assessment form should be given to the Roadmaster. The BNSF Project Manager also should maintain a record of these assessments.

Safety Assessment Form BNSF Flaggers					
Date of Assessment:					
Assessment Performed by:			Project:		
No. Flaggers Assessed:			Location:		
	YES	**NO**		**YES**	**NO**
Personal Protective Equipment:			***Contractor Awareness:***		
Safety Glasses with Side Shields:			Heavy Equipment Procedures:		
Lace-up Safety-toed Boots:			Knows "SAFETY ZONE" distance:		
Hard Hats:			Proper Communication (Radio, etc.):		
High Visibility Wear (vest, hat cover, etc.):			Properly Administers:		
Seat Belts (if applicable):			Form "B":		
Job Briefing:			***Track & Time:***		
Conducted Job Briefing for current task:			Multiple Work Groups:		
Knows when to give another briefing:			Lookout:		
Knowledge:			***Readily Available:***		
Knows when to expect train movement:			Rule Book:		
Knows what is required when in doubt:			Timetable:		
Knows when to report an injury:			General Orders:		
Knows proper vehicle speed:			General Manager's Notices:		
Knows who to notify if railroad damaged:			***Engineering Instructions:***		
Knows who to contact in case of emergency:			On-Track Safety Program:		
Comments:					

Figure 24-4a. Side 1 of Safety Assessment Form—BNSF Flaggers

Assessment Guidelines

Contractor Awareness:

Heavy Equipment Procedures: Yes ( ) No ( )

a. Working radius ____ feet
b. Blind side right left both
c. Backing up procedure
d. Parking behind
e. Passing: radio contact, eye contact, stop and wait
f. Moving across track
g. Working in safety zone
h. Working in safety zone with orange fence
i. Working in tight area
j. Loading, lifting, and swinging loads
k. Operating headlight and backup alarms

Proper Communication: Yes ( ) No ( )

Radio
Light (blue or white)
Personal contact
Tapping hard hat
Flag (red or green)

Properly Administers:

Form B: Yes ( ) No ( )

Job briefing, flagger name, location, vehicle type, additional flagger assisting and location
Time
Limits
Division
Subdivision
Emergency plan

Track & Time: Yes ( ) No ( )

Limits
Time
Communication
Clearance requirements
Emergency plan

Multiple Work Groups: Yes ( ) No ( )

a. Communication
b. Clearance requirement
c. Emergency plan

How many pieces of equipment, different work groups, and BNSF gangs are being provided protection?

Contractor's foreman helping to keep track of equipment operator's acknowledgements. If not clear if all contractor personnel have acknowledged understanding, then repeat the notice to clear hot zone and request acknowledgement.

If all fails and you know that track is not impassable and BNSF gangs are not working in limits, then clear trains to proceed through limits at restricted speed.

Lookout: Yes ( ) No ( )

a. Lone worker form completed properly?
b. Communication
c. Clearance requirements
d. Emergency plan
e. No running equipment or noise in area

Figure 24-4b. Side 2 of Safety Assessment Form—BNSF Flaggers

24.2 General Contract Requirements

24.2.1 Contract Requirements

Contracts must be prepared by the Service Contracts group of Strategic Sourcing and Supply and must be approved by BNSF's legal counsel before execution. An officer of the Company who has been given "Delegation of Authority" by his or her immediate Supervisor must execute all contracts. This "Delegation of Authority" must be filed with Information Resource Management in Fort Worth. BNSF employees should never execute contracts presented to them by outside parties; forward these requests to the Service Contracts group for further handling.

24.2.2 Insurance

Contractors performing services on BNSF property must be covered with a service contract and carry the appropriate insurance as required by the form of contract to be used to cover the specific work to be done. The limits of coverage vary depending on the services to be provided, so BNSF employees should check their Service Contracts User's Manual or contact the Service Contracts group to determine the specific insurance requirements necessary.

24.2.3 Competitive Bids

If the consideration for a specific project is expected to exceed $100,000, a formal, written bid invitation must be sent to at least two bidders.

24.2.4 Performance and Payment Bonds

When preparing bids for larger projects, and on all major construction projects, decide whether to require Performance and Payment Bonds. As a general rule, if there is no experience with a contractor, or if the project work is over $100,000, Performance and Payment Bonds should be required.

Additionally, on larger projects, 10 percent retainage must be withheld until a BNSF representative approves project completion. A Waiver of Lien is required from the contractor before final payment is made.

Note: For more detailed information covering the above subjects, BNSF employees should be governed by the processes outlined in the "Policy Guidelines" of the Service Contracts User's Manual.

24.2.5 Contracting Notification

Before awarding a contract for construction services, proper notification must be sent to the unions impacted by the project. Complete the form available on the BNSF Web page: Departments/Operations/Engineering-Exempt View, and distribute per the instructions provided with the form, furnishing all pertinent data for the specific project including reason and explanation for contracting the project. At least 15 calendar days are required between Labor Relation's actual notification and start of the work, not from the date the form is submitted to Labor Relations.

24.2.6 Work Directives

A work directive is defined as a written directive to the contractor, issued on or after the effective date of the agreement and signed by the owner and recommended by the Engineer. It orders an addition, deletion, or revision to the work, or responds to differing or unforeseen physical conditions under which the work is to be performed. A work directive will not change the contract price or the contract time but is evidence that the work will be incorporated in a change order to the contract.

The work directive must have the required approvals before the contractor is instructed to commence with the work.

Work directives shall be incorporated into a Change Order on a timely basis (usually monthly). See "Work Change Directive" form, Figure 24-5.

Work Change Directive

(Instructions on reverse side.) No._____

Project:

Date of Issuance: Effective Date:

Owner:

Owner's Contract No.:

Contractor: Engineer:

You are directed to proceed promptly with the following changes:

Description:

Purpose of Work Change Directive:

Attachment: (List documents supporting change)

If a claim is made that the above changes have affected Contract Price or Contract Times, any claim for a Change Order based thereon will involve one or more of the following methods of determining the effect of the changes:

Method of determining change in Contract Price:

- ❑ Unit prices
- ❑ Lump sum
- ❑ Other _____

Estimated increase (decrease) in Contract Price: $_____ If the change involves an increase, the estimated amount is not to be exceeded without further authorization.

Method of determining change in Contract Times:

- ❑ Contractor's records
- ❑ Engineer's records
- ❑ Other_____

Estimated increase (decrease in Contract Times:

Substantial Completion: _____ days

Ready for final payment: _____ days

If the change involves an increase, the estimated times are not to be exceeded without further authorization.

Recommended: **Authorized:**

Engineer: Owner:

By (Authorized Signature): By (Authorized Signature):

Accepted:

Contractor: By (Authorized Signature):

Figure 24-5. Work Change Directive

24.2.7 Change Orders

A Change Order is a document recommended by the Engineer and signed by the owner and the contractor that authorizes an addition, deletion, or revision in the work and/or adjustment in the contract time or contract price.

Work cannot be invoiced until the Change Order incorporating the work has been signed and approved. See the "Change Order" form (Figure 24-6).

<table>
<tr><td colspan="3">Change Order</td></tr>
<tr><td colspan="2">(Instructions on reverse side.)</td><td>No._____</td></tr>
<tr><td colspan="3">Project:
Date of Issuance: Effective Date:
Owner:
Owner's Contract No.:
Contractor: Engineer:</td></tr>
<tr><td colspan="3">You are directed to proceed promptly with the following changes:
Description:
Purpose of Work Change Directive:
Attachment: (List documents supporting change)</td></tr>
<tr><td colspan="2">Change in Contract Price:</td><td>Change in Contract Times:</td></tr>
<tr><td colspan="2">Original Contract Price $_____</td><td>Original Contract Times
Substantial Completion: _____
Ready for final payment:_____ (days or dates)</td></tr>
<tr><td colspan="2">Net changes from previous Change Orders No. ___ to No.___
$_____</td><td>Net changes from previous Change Orders No. ___ to No.___
_____ (days)</td></tr>
<tr><td colspan="2">Contract price prior to this Change Order $_____</td><td>Contract Times prior to this Change Order:
Substantial Completion:
Ready for final payment: _____ (days or dates)</td></tr>
<tr><td colspan="2">Net increase (decrease) of this Change Order $_____</td><td>Net increase (decrease) of this Change Order _____ (days or dates)</td></tr>
<tr><td colspan="2">Contract price with all approved Change Orders $_____</td><td>Contract times with all approved Change Orders
Substantial Completion:
Ready for final payment: _____ (days or dates)</td></tr>
<tr><td>Recommended:
By: (Engineer Authorized Signature)_____
Date:</td><td>Approved:
By: (Owner Authorized Signature)_____
Date:</td><td>Accepted:
By: (Contractor Authorized Signature)_____
Date:</td></tr>
</table>

Figure 24-6. Change Order

24.2.8 Work Directive/Change Order Procedures

1. Work directives are issued when a contract change is required because of:
    a. Site condition is different (conditions depicted in the specs or drawings are not actually encountered).
    b. There is a design deficiency, mistake, or omission.
    c. The consultant adds work to the contract through drawing/spec revisions.
    d. The consultant identifies something that needs to be done to meet BNSF's expectations.
    e. BNSF requests added work.
    f. The contractor suggests a different way of accomplishing BNSF's desires via either a revision to design or required construction procedure.
2. Consultant defines the Scope of Work. This is a narrative description of what is to be done. It normally is accompanied by a site sketch, drawing, and revised or additional specifications.
3. Approval is obtained from the sponsoring department for change, where appropriate.
4. Contract is reviewed for two items:
    a. Are any of the items of work already covered in the contract? If so, inform the contractor that they must perform that work.
    b. If the item of work is outside the contract scope, is there an existing unit price already negotiated? If so, use this unit price in preparing the cost estimate.
5. Consultant prepares a cost estimate using the Scope of Work.
    a. Check contract for any existing unit prices that can be used.
    b. Check local suppliers for costs of materials.
    c. Check the contract for established equipment rates. Most contracts have established hourly rates for major pieces of equipment.
    d. Check an estimating catalog (i.e. Means).
    e. Generally, allow for a 10-percent overhead and profit mark-up.
    f. Include additional time contractor is entitled to because of the change.
    g. Provide total cost.

6. Sometimes a detailed Scope of Work cannot be prepared because the quantities are too difficult to estimate or because the needed change is time critical and must be executed immediately. In these cases, a work directive may be issued with a "not to exceed" amount. Ensure that the work accomplished is closely documented so you will be able to complete the Change Order accurately.
7. Contractor receives Scope of Work to prepare cost proposal.
    a. Compare cost with the estimate. If close, say within 10 percent, and the quantities are accurate, accept the price. If not, check the proposal to see where the significant variances are. If it is just a difference in the costs the contractor wants to charge, try to negotiate a more reasonable price.
    b. Once agreement is reached on price, complete the Work Change Directive form (Figure 24-5), attaching the Scope of Work.
    c. Consultant will sign and obtain the contractor's signature and then forward to BNSF Field Representative for handling through proper delegation of authority.
8. The delegation of authority must be adhered to in obtaining approval and the AFE must contain adequate funding.
9. When all documents are signed, consultant distributes copies to the contractor, BNSF representative(s), and the Consultant CM who will oversee the work. Originals are saved for the Change Order process.
10. Consultant prepares the Change Order, providing all information required and attaching supporting documents including, in order:
    - Work directives
    - Contractor's cost proposal
    - Estimate

    If no change in contract times is needed, or vice versa, no change in contract price, be sure to cross out the one that does not apply.
11. Consultant signs, forwards to contractor for signature first, and then forwards to BNSF Field Representative for signature through proper delegation of authority.
12. Work cannot be invoiced until all approvals are obtained.
13. Contract team makes distribution of fully signed Change Order.
14. The Project Manager shall regularly monitor project funding commitments to ensure that they do not exceed the authorized funding, leaving an appropriate contingency with respect to the portion of the project that remains to be completed.

See Figure 24-7 for a flow chart of the full process and examples of the form.

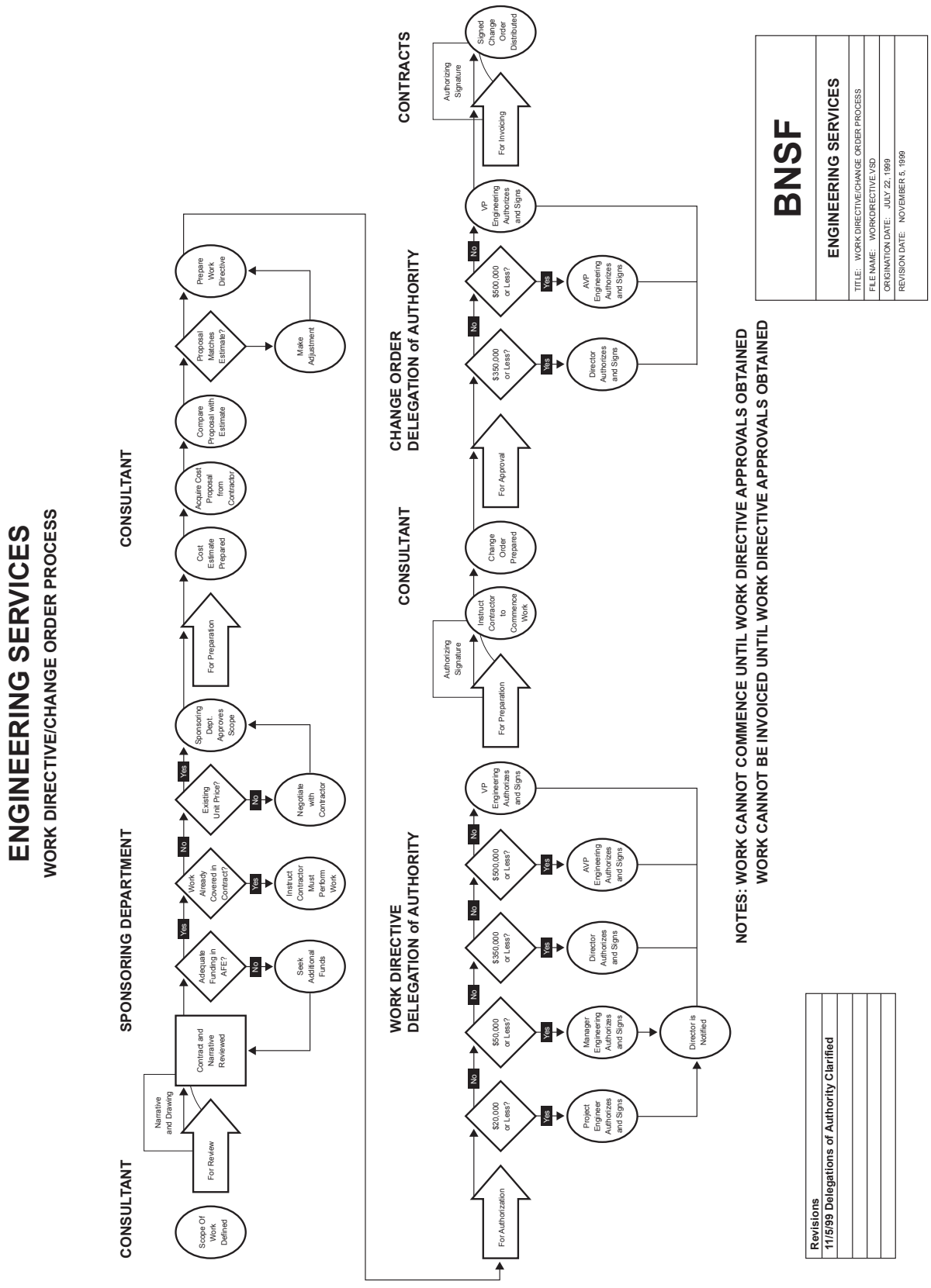

Figure 24-7. Engineering Services Work Directive/Change Order Process

24.2.9 Invoices

The BNSF Project Manager shall require the contractor to submit invoices for approval on a timely basis. They should include only work that has been completed through the date of the invoice. Work progressed by work directives shall not be invoiced until the Change Order covering that work has been signed and approved. The submitted invoice should have all the documentation needed to verify amounts and quantities listed in the invoice. This will help reduce the possibility of the payment being delayed because information was not available for approval.

The responsible party shall verify that invoices are correct and that the work was performed satisfactorily, then forward them for approval(s) and/or payment, all in a timely manner, usually within 1 to 2 weeks of receipt of invoice.

For projects continuing beyond one pay period, the contractor shall submit the invoice on the "Application and Certification for Payment" form (see Figure 24-8), and include a "transmittal letter" on company letterhead. The transmittal letter shall indicate the pay period and pay request amount and shall be an original. Faxed copies will not be accepted. This requirement shall be exclusive of, and not applicable to, "Service Contracts."

A schedule of values reflecting the portion of work completed should be attached to each invoice.

APPLICATION AND CERTIFICATION FOR PAYMENT

To:	Burlington Northern Santa Fe Railway Company 4515 Kansas Avenue Kansas City, Kansas 66106-1199			**Application No.** **Period:**	
From:	***Contractor*** ***Address*** ***City, State, Zip***	**Via Engineer:**	***Consultant*** ***Address*** ***City, State, Zip***	**Project Number:** **Contract Date:**	
Contract For:	***Short Project Description***				

1	**Original Contract Sum**		
2	**Net Changes by Change Orders**		
3	**Contract Sum to Date** **(Line 1 + 2)**	$ -	
4	**Total Completed and Stored To Date** **(Details Contractor Spreadsheet)**	$ -	
5	**Retainage at 10%**	$ -	
6	**Total Earned Less Retainage** **(Line 4 - 5)**	$ -	
7	**Less Previous Certificates for Payment** **(Line 6 from prior certificates)**	$ -	
8	**Current Payment Due** **(Line 6 - 7)**	$ -	
9	**Balance to Finish, Including Retainage** **(Line 3 - 4)**	$ -	

Change Order Summary	**Additions**	**Deductions**
Total changes approved in previous months by owner		
Total approved this month		
Totals	0	0
NET CHANGES by change order	0	

Approved

Contractor: **Date:**

Superintendent

Engineer: **Date:**

Construction Manager

Engineer: **Date:**

Project Manager

BNSF Approved

Vendor Code	**Contract #**
Location	**Authority**

Account	**Class**	**Reason**	**Center**	**Amount**
				$

OK to Pay **TOTAL $**

OK to Pay

Figure 24-8. Application and Certification for Payment

24.2.10 Liens and Claims from Labor and Materials Furnished

The BNSF Project Manager shall be aware that the contractor must promptly pay or cause to be paid, all subcontractors and persons furnishing labor, services, articles, or materials for the work, pursuant to an agreement with the contractor or any subcontractor, and must deliver the work free from any claims or liens. If the contractor fails to do so, the railroad may pay and discharge any lien or claim and deduct the amount paid from money that may be payable to the contractor, even if there is a dispute between the contractor and the person asserting the claim or lien. For projects continuing beyond one pay period, the contractor shall submit a partial lien release for previous invoices paid.

Before payment of the final estimate, the contractor shall furnish the Engineer a notarized waiver of lien from itself and all of its subcontractors and material suppliers, as evidence that the work is free and clear from all liens for labor and materials, and that no claim exists for which any lien could be filed or enforced. Examples of Lien Release forms follow; see Figures 24-9, 24-10, 24-11, and 24-12.

Payment Application No. _____

BNSF Project: _____

Date: _____

Contractor's Final Release and Lien Waiver

I, _____, being first duly sworn on my oath, certify and state that
(Print Name)

I hold the position of _____ for _____
(Title) (Name of Contractor)

and that I am the authorized representative for the Contractor named in the contract by and between the Contractor and the Burlington Northern and Santa Fe Railway Company, dated the ____ day of _____, 20__, (the "Contract") for the project located at _____.
(Description of Project)

On behalf of the Contractor, I certify that the work provided for in the Contract has been entirely completed in accordance with the terms thereof and the Contract Documents; that all of the bills for materials used in or about said work, and for all labor employed in connection with the said work have been fully paid; that all of the work performed under the Contract is free and clear from all liens for labor or materials and that no claim exists out of which a lien may grow, and that all of the obligations of Contractor of every kind and description arising out of or connected with the Contract, including payment of various taxes imposed by any governmental authority, have been fully satisfied. Contractor has obtained, and provides herewith, the Final Release and Lien Waivers executed by all subcontractors and major suppliers.

The amount of $_____, the receipt of which is hereby acknowledged, represents full and final payment, including retainage, for all labor performed and materials furnished by the Contractor, its subcontractors, suppliers, agents, and employees on the above-referenced project. In consideration of such payment, the Contractor hereby releases all mechanic's and materialmen's lien rights resulting from labor and materials, subcontract work, or other work, equipment, rents, services, or supplies furnished and performed by the Contractor under the Contract. The Contractor further agrees to indemnify, defend, and hold harmless the Burlington Northern Santa Fe Railway Company, its successors and assigns, from any claim or claims hereinafter made by suppliers of materials or subcontractors, employees, servants, agents, or assigns arising out of or connected with the work performed under the Contract. The Contractor understands that the Burlington Northern and Santa Fe Railway Company will act and rely upon this document in releasing any funds due or owing to the Contractor.

Executed this _____ day of _____, 20___.

Signature: _____

Company/Title: _____

State of: _____

County of: _____

Subscribed and sworn to before me, a Notary Public in and for said County and State, this ____ day of _____, 20____.

Notary Public Signature: _____

My commission expires: _____

Figure 24-9. Contractor's Final Release and Lien Waiver

Payment Application No. _____

BNSF Project: _____

Date: _____

Contractor's Partial Release and Lien Waiver

I, _____, being first duly sworn on my oath, certify and state that
(Print Name)

I hold the position of _____ for _____
(Title) (Name of Contractor)

and that I am the authorized representative for the Contractor named in the contract by and between the Contractor and the Burlington Northern and Santa Fe Railway Company, dated the ____ day of _____, 20__, (the "Contract") for the project located at _____.
(Description of Project)

I certify that the Contractor has furnished all materials and performed all work as identified in Payment Application No. ____, dated _____, 20____, in the amount of $_____, and that such materials and work have been furnished and performed in strict compliance with the Contract with the Burlington Northern and Santa Fe Railway Company on the above-referenced project and the Contract Documents.

The amount of $_____, the receipt of which is hereby acknowledged, represents payment in full for all labor performed and materials furnished by the undersigned, its subcontractors, material vendors, suppliers, agents, and employees on the above-referenced project. Further, the Contractor hereby warrants that all subcontractors, material vendors, suppliers, agents, and employees have been paid in full by the Contractor for all materials and labor that have been furnished and performed as identified in the prior Payment Applications. The attached partial lien waivers cover all its materials and subcontractors for this project for the period ending _____, 20____. The undersigned understands that Owner or anyone in its behalf may and will act and rely upon this instrument in releasing any funds due or owing to the Contractor.

In consideration of the present progress payment, the Contractor hereby releases all mechanic's and materialmen's lien rights resulting from labor and materials, subcontract work, or other work, equipment, rents, services, or supplies heretofore furnished and performed by or for the Contractor under said Contract, and Contractor hereby agrees to indemnify, defend, and hold harmless the Burlington Northern and Santa Fe Railway Company, its successors, and assigns from any claim or claims hereinafter made by suppliers of materials to Contractor, by the subcontractor, employees, servants, agents, or assigns therefor, arising out of or connected with the work performed under the Contract. The Contractor understands that the Burlington Northern and Santa Fe Railway Company will act and rely upon this document in releasing any funds due or owing to the Contractor.

Executed this _____ day of _____, 20___.

Signature: _____

Company/Title: _____

State of: _____

County of: _____

Subscribed and sworn to before me, a Notary Public in and for said County and State, this ____ day of _____, 20____.

Notary Public Signature: _____

My commission expires: _____

Figure 24-10. Contractor's Partial Release and Lien Waiver

BNSF Project: _____

Date: _____

Subcontractor/Supplier's Final Release and Lien Waiver

I, _____, being first duly sworn on my oath, certify and state that
(Print Name)

I hold the position of _____ for _____
(Title) (Name of Contractor)

and that I am the authorized representative for the Subcontractor/Supplier named in the subcontract/purchase order by and between the undersigned and _____.
(Description of Project)

The amount of $_____, the receipt of which is hereby acknowledged, represents full and final payment for all labor performed and materials furnished by the undersigned for labor and materials provided to the project in accordance with the subcontractor/purchase order, including all prior progress payments received. In consideration for such payment, the undersigned hereby releases all mechanic's and materialmen's lien rights resulting from labor and materials furnished and performed by the undersigned under the subcontractor/purchase order arising from the undersigned's labor or materials provided to the project.Executed this _____ day of _____, 20___.

Signature: _____

Company/Title: _____

State of: _____

County of: _____

Subscribed and sworn to before me, a Notary Public in and for said County and State, this ____ day of _____, 20____.

Notary Public Signature: _____

My commission expires: _____

Figure 24-11. Subcontractor/Supplier's Final Release and Lien Waiver

BNSF Project: _____

Date: _____

Subcontractor/Supplier's Partial Lien Waiver

I, _____, being first duly sworn on my oath, certify and state that
(Print Name)

I hold the position of _____ for _____
(Title) (Name of Contractor)

and that I am the authorized representative for the Subcontractor/Supplier named in the subcontract/purchase order by and between the undersigned and _____dated the _____
(Name of General Contractor)

day of _____, 20__, (the "Contract") for the project located at _____.
(Description of Project)

The amount of $_____, the receipt of which is hereby acknowledged, represents full and final payment for all labor performed and materials furnished by the undersigned and for labor and materials provided to the project in accordance with the subcontractor/purchase order, for the period ending the _____ day of _____, 20____. In consideration for such payment, the undersigned hereby releases all mechanic's and materialmen's lien rights resulting from labor and materials furnished and performed by the undersigned under the subcontractor/purchase order arising from the undersigned's labor or materials provided to the project as of the date of this partial lien waiver.

Executed this _____ day of _____, 20___.

Signature: _____

Company/Title: _____

State of: _____

County of: _____

Subscribed and sworn to before me, a Notary Public in and for said County and State, this ____ day of _____, 20____.

Notary Public Signature: _____

My commission expires: _____

Figure 24-12. Subcontractor/Supplier's Partial Lien Waiver

24.2.11 e-RAILSAFE

Contractors may be required to participate in or complete a survey as a part of the e-RAILSAFE program. This is currently available by accessing the e-RAILSAFE Web site.

24.3 Flagging

24.3.1 Construction Flagging Procedures

1. A flagger generally is required when contractors are working within 25 feet of a live track (refer to Engineering Instruction 1 Safety, specifically section 1.3.3). A flagger may be required when contractor work is located more than 25 feet from the track if:

   - The work could foul a track, such as with a large crane.
   - Excavation activities could undermine a track.
   - Overhead wire work could potentially fall onto the track.

2. A flagger is a BNSF employee who is qualified in Maintenance of Way Operating Rules and who will:

   a. Obtain authority or provide protection for work that fouls or may foul a track.

   b. Provide authority or protection according to BNSF MWOR and Engineering Instruction 1 Safety.

   c. Communicate with the appropriate Train Dispatcher and ensure that protection is in place before beginning work within 25 feet of a live track. Trains will not be allowed into the working limits until the flagger knows all contractor employees are clear of the track.

   d. Conduct a thorough job briefing before beginning work that may foul a track. The job briefing will include the flagger and the contractor's employees. The job briefing must include the type of protection and the means of communication to be used.

   e. Clearly understand the acknowledgement for the methods listed below, especially if the method of communication requires employees to look at the flagger to communicate (such as flags). The flagger must establish an acknowledgement that cannot be confused with other signals. A new job briefing must be held when conditions change.

      - Air horn
      - Flags
      - Lights and flashing lights
      - Radios with designated channel for this use only
      - Verbal instructions
      - Hand signals if standardized and clear understanding between flagger and contractor employees
      - A combination of the above

3. An engineering consultant, when specifically authorized by the BNSF project representative, may work as a "lone worker" or with lookout protection if so trained and qualified. This activity will be governed by MWOR Rules 6.3.4 and 6.3.5.
4. If the contractor's work will not foul the track or otherwise cause a hazard to railroad operations, the BNSF project representative may determine that a flagger is not required for work within 25 feet of a track, but not fouling any track. The BNSF project representative may determine that another means of protection is required in this case.

24.3.2 Use of Construction Fence for Protection

BNSF supervision will determine locations and situations where construction fence will be used.

1. Fence will be as follows:
   - At least 8 feet from the near rail and not used where men or equipment could likely be within 8 feet of the near rail of a live track.
   - At least 4 feet high on steel posts, straight and secure to prevent sagging or dislocation by the force of passing trains.

   The fencing material must be bright orange.
2. For some operations, such as work involving cranes, scrapers, and end dump trucks, a flagger and Form B protection or other form of authority or protection will be required. For lower risk work such as sub-grade or sub-ballast finishing, a Form B may not be required with the fence in place.
3. When a fence and Form B protection are used, an adequate number of flaggers should be used to protect work location as follows:
   - Equipment must be stopped when a locomotive headlight is observed. Use radio notification with equipment or visual acknowledgement.
   - When BNSF supervision feels that headlight notification does not give adequate warning, equipment may be made to stop upon radio contact with approaching traffic.
   - Equipment, in most cases, may resume work upon the head end passing.
   - For trains stopping in work areas, workers and equipment may resume work until notified by the flagger of imminent movement, then cease work until the head end of the train passes.

24.4 Consultant Services

24.4.1 Procedures for Selecting a BNSF-Approved Consultant

When choosing consultants, use a BNSF-approved firm as listed in the BNSF Consulting Firm Book. The firms listed in this manual have executed a contract with BNSF for Engineering Services and have provided proof of financial capability and proper insurance.

If an engineering firm does not appear in this book and shows interest in doing work for BNSF, or if you wish to have the firm considered for inclusion, the firm should contact Engineering Services in Kansas City.

For environmental consulting, contact the appropriate Manager Engineering for the applicable Service Region. Reference Managers' Engineering and associated telephone numbers on the Construction Engineering Intranet Home Page.

24.4.2 Task Orders

To initiate a project requiring consultant services:

1. The BNSF Project Manager shall provide information regarding the estimate type required (cost estimate, proposal, bid proposal), Scope of Work, schedule, and if appropriate, a budget, to the consultant for a proposal.
2. The consultant shall provide a proposal for the work with a not to exceed cost estimate.
3. Once the BNSF Project Manager has received an acceptable proposal from the consultant, the Manager will forward a copy of the proposal to Engineering Contracts for preparation of the Task Order. The Task Order requires information including:
    - A description of the desired services
    - BNSF Project Manager information
    - Consulting Program Director information
    - Consulting Project Manager information
    - "Not to exceed" cost basis information
    - Total budget for the project
    - Cash flow information by month
    - Accounting information for invoice purposes. See the "Task Order" form (Figures 24-13a and 24-13b).

The Burlington Northern and Santa Fe Railway Company Contract for Architectural, Engineering, and Design Services

Exhibit "A"

Task Order

Location:
Description of Project:

Date Issued:
Task Order No.:

Consultant's Address:

Gentlemen:

3. We request that you perform the following specified services: Per attached Proposal.
4. The BNSF Project Manager for this work shall be:

   Name:
   Title:
   Address:
   City/State:
   Phone:
   Fax:

5. He/She shall be responsible for the operation, budget, and schedule of the project. All decisions shall have his or her approval.
6. The Consultant's Program Director for this work shall be:

   Name:
   Title:
   Address:
   City/State:
   Phone:
   Fax:

7. The Consultant's Program Director for this work shall be:

   Name:
   Title:
   Address:
   City/State:
   Phone:
   Fax:

8. The Consultant's Sub-Consultant for this work shall be:

Name	Address	Contact	Phone

Figure 24-13a. Task Order

9. The work is to be performed on the following cost basis: Actual Time and material NOT to exceed:
10. The total budget for this project is estimated at:
11. The accounting for this work shall be as follows:

Vendor No.:	Center:
Contract Number:	Location Code:
Account:	Authority No.:
Cost Class:	Task Order:
Reason:	

All invoices, whether internal or from outside contractors, shall have the appropriate accounting before they are submitted to BNSF.

12. The following applies only to Task Orders issued for track engineering design and/or consideration:

    Consultant must provide "as built" drawings for construction of new track, yard facilities, buildings, intermodal/auto facilities, environmental projects, and other improvements. Consultant has 30 days from completion to submit drawings.

    All drawings should be in electronic format, MicroStation 5, 95, or SE files, submitted on CD-ROM, Zip Disks, or 3 ½" disks. BNSF has CADD standards for track construction projects for the proper levels, colors, and line weights of all features. Call 913-551-4523 to obtain the BNSF standards for station maps, right-of-way maps, and MicroStation cell libraries.

    All submittals must have a letter of transmittal, which includes a list of each file submitted and a description of what each file contains (cover sheet, index, alignment, profile, etc.).

    If multiple projects are submitted together, they should be separated by media or directory structure. Only one project per disk unless separated into directories on the disk.

    All submittals should be made to the Manager Maps and Records, 4515 Kansas Avenue, Kansas City, KS 66106.

13. Billing for services provided under this authorization shall be addressed to the BNSF Project Manager noted above.
14. This additional work will be handled as a supplement to our contract with you, _____ covering other engineering services. All terms of this contract will apply to this newly authorized work.

Accepted:	Accepted:
	The Burlington Northern and Santa Fe Railway Company
By:	By:
Title:	For: Vice President Mechanical & Engineering
Date:	Date:

Signature of Consultant is not required if signed proposal was provided.

Please return one signed copy to this office.

Figure 24-13b. Task Order (Backside)

24.4.3 Duties of Inspectors

When Consultant Inspectors are required to observe or monitor construction activity and to provide technical support and testing, the following general duties will be required of the Consultant Inspector:

1. Comply with all safety rules and wear all appropriate PPE.
2. Monitor compliance to safety rules, including proper PPE attire by all people on BNSF property at the job site and report any deficiencies for correction by the responsible party. The Inspector has the authority to stop work due to noncompliance to the safety rules.
3. Monitor closely all work activity at the job site within 25 feet of the centerline of any track for compliance to BNSF flagging requirements. The Inspector shall report noncompliance for correction by the responsible party. The Inspector has the authority to stop work due to noncompliance to the flagging requirements.
4. Be onsite every day. If the Inspector is required to be absent for meetings, vacation, sickness, etc., notify the Project Manager to arrange replacement.
5. Make daily report to Project Manager of the day's activities including the weather report. Also state if no work was performed.
6. Keep a daily journal and record of all pertinent information.
7. Read and be familiar with job plans and specifications. Monitor the project's construction for conformance and report any deviations for correction by the contractor.
8. Monitor project testing for conformance to job requirements. Report any deviation to the testing company for correction.
9. Immediately follow up with the responsible party for compliance with reporting requirements on any job site injury.
10. Obtain written verification from the contractor that the utility locator service has been notified and necessary utility relocations have been made before starting project work in the area.
11. Notify BNSF signal and communications personnel when existing line locations need to be flagged on the project. The Iinspector must ensure that the Underground Cable Location and Acknowledgement Form has been completed for the area before beginning work. The Inspector has the authority to stop work if this has not been accomplished.

12. Proof roll the entire grading area after testing, but before releasing the contractor's equipment.
13. Attend briefings and meetings.
14. Review billing for accuracy and completeness.
15. Assist in preparation and review of work directives and handle them for approval *before* work is performed.
16. Assist in preparation of Change Orders and forward to BNSF representative for approval.
17. Perform Safety Assessments.
18. Be "Lone Worker" qualified.
19. Have emergency numbers (i.e. Railroad and others) and be prepared to handle these types of calls.
20. Note any deviations to safety rules, PPE requirements, flagging requirements, job plans, specifications, project testing, injury reporting requirements, utility location and relocation, and signal and communication line flagging. Include in daily journal and daily reports to Project Manager.

24.5 Construction Procedures

24.5.1 Crane Operations With Wind Guidelines

When operating a crane in the wind, act according to the operator's manual and load capacity chart. The operator's manual and load capacity chart shall be available to the BNSF representative upon request from the crane operator. The wind effect on the crane operation is dependent on:

- The orientation of the crane and load with the wind direction
- The cross-sectional area of the load and boom (sail area) that the wind encounters

A general rule is to make reductions in the load capacity chart when winds exceed 20 MPH and cease operations when winds exceed 30 MPH. A decision to cease operations due to high winds shall be judged in the field. Use the table below to determine wind speed in the absence of a wind velocity gage.

Wind Force		Wind Velocity MPH	Visible Indicators Effects of Wind as Observed on Land
Beaufort Scale	Designation		
0	Calm	<1	No wind, smoke rises vertically
1	Light Air	1–3	Wind direction seen by smoke but not by wind vanes
2	Light Breeze	4–7	Wind felt on face; leaves rustle; wind vane moves slightly
3	Gentle Breeze	8–12	Leaves/small twigs in constant motion; wind extends flag
4	Moderate Breeze	13–18	Raises dust and loose paper; moves small branches
5	Fresh Breeze	19–24	Small trees in leaf begin to sway; on ponds, crested wavelets form
6	Strong Breeze	25–31	Large branches in motion; telegraph wires whistle; umbrellas used with difficulty
7	Moderate Gale	32–38	Whole trees in motion; walking against wind is inconvenient

24.5.2 False-work for Overhead Structures

A. Approval

BNSF must approve false-work plans that may affect railroad operations before work begins. Include with the plans all calculations used in making design decisions.

B. Design

A registered professional engineer in the state where the work is to occur must design and stamp false-work. The State of California has published the CALTRANS False-work Manual. It is an excellent guide to designing false-work over the railroad.

C. Horizontal Clearance

BNSF desires 15 feet from the centerline of the track to the near face of any false-work. Exceptions can be made for extreme circumstances. State requirements will determine the minimum side clearance.

D. Vertical Clearance

Temporary vertical clearance can be as low as 21 feet, 6 inches above the top of the rail unless otherwise stipulated by the state. In rare occasions lesser clearance will be allowed if there is an existing restrictive clearance in the vicinity.

E. Contractors

Contractors, sub-contractors, and their employees working on BNSF right-of-way must receive BNSF Contractor Safety Orientation and have Railroad Protective Liability Insurance before occupying BNSF property. A BNSF flagger must protect work within 25 feet of the centerline of the near track.

F. False-work Removal

Do not drop material onto the track structure. Lower false-work materials under control using winches or cranes. Dismantle false-work so as not to delay trains. BNSF cannot guarantee that there will be enough track time to remove all false-work over the track in one day. Stage work accordingly.

24.5.3 Unacceptable Errors in False-work Design and Construction

These are common unacceptable errors in false-work design and construction:

- Compression flange is not supported against buckling in both directions. This generally occurs at the outside stringers.
- Footing blocks are eccentrically loaded in the field but the design calculations show them centered under the load.
- Footing blocks are placed in a ditch and are subject to scour and/or soils saturation during rainstorms.
- Timber footing blocks are split and in poor condition.
- Wood wedges placed between the posts and footings are too small, of poor quality, or of insufficient number to satisfy the maximum allowable compressive force perpendicular to the grain.
- Posts and bracing are not through bolted with 5/8-inch bolts.
- Sheathing is not secured to resist suction forces from high-speed trains.

24.5.4 Excavation and Shoring Adjacent to Tracks

A. Approval

BNSF or its representative shall approve before work begins trenching and shoring plans that may affect railroad operations. Include with the plans all calculations used in making design decisions. Computer printouts are not satisfactory to submit for design calculation check because it is not possible to document the software internal operation.

B. Railroad Affected Zone

Excavation that would intersect a line drawn on a 1:1 slope from a point 7 feet from the centerline of the track at the top of the rail is considered to affect railroad operations. This line was selected to avoid disturbing the theoretical toe of ballast.

C. Railroad Concern Zone

Excavation that would intersect a line drawn on a 1.5:1 slope from a point 11 feet from the centerline of the track at the top of rail is considered to concern the railway company. BNSF or its representative will determine the necessity for shoring. See Figure 24-14 for "Zone of Influence" diagram.

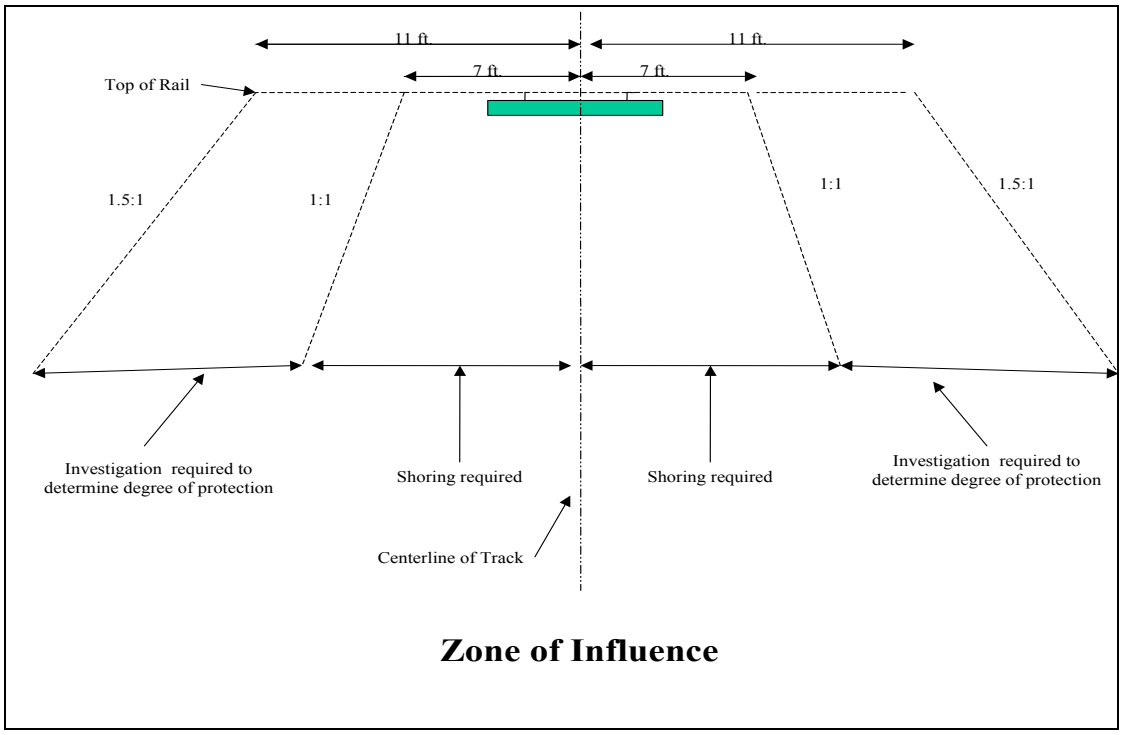

Figure 24-14. Zone of Influence

D. Outside Railroad Affected Zone and Railroad Concern Zone

Any excavation that would not intersect the Railroad Affected Zone and Railroad Concern Zone shall be governed by local, State, and Federal laws.

E. Design

A registered professional engineer in the state where the work is to occur must design and stamp shoring and temporary retaining walls. The State of California has published the CALTRANS Trenching and Shoring Manual. It is an excellent guide to designing shoring and temporary retaining walls next to the railroad.

F. Horizontal Distance

BNSF desires a minimum of 25 feet from the centerline of track to the near face of any excavation. For exceptions, refer to Figure 24-14, "Zone of Influence" diagram.

G. Contractors

Contractors, sub-contractors, and their employees working on BNSF right-of-way must receive BNSF Contractor Safety Orientation and have Railroad Protective Liability Insurance before occupying BNSF property. A BNSF flagger must protect work within 25 feet of the near track.

H. Shoring and Temporary Retaining Wall Removal

Remove shoring and temporary retaining walls when the work is complete. With BNSF approval, sheet piling and soldier piles may be left in place. Cut off left-in-place piling at least 2 feet below the top of the rail. Paint all exposed steel left in place per section 4700 of the BNSF Standard Construction Specifications.

24.5.5 Unacceptable Errors in Shoring Design and Construction

The following are common unacceptable errors in shoring design and construction:

- Plans do not relate the horizontal and vertical dimensions to the track structure.
- Shoring is designed to stress the materials 33 percent over published strengths because the designers consider the shoring to be temporary. BNSF does not allow the overstressed design because we cannot be assured that the structure is temporary and because materials are usually second-hand with questionable strength as compared to new materials.
- Work is staged so that train traffic cannot be run at any time.
- Trainman walkways are not provided.
- Excavations are not protected from someone accidentally falling into them.
- Excavation becomes a run-off basin.
- On soldier pile and lagging retaining walls, the soil is over-excavated when the lagging is placed leaving voids between the lagging and the undisturbed soil. Fill the voids with "one sack/CY" or greater flowable backfill.
- Shoring is not built according to approved plans and specifications. Substitutions are made in the field without the knowledge of BNSF or its representatives.

24.5.6 Permits

When constructing or maintaining a roadbed or facility, obtain the applicable permits before beginning construction. Permits may be required from but are not limited to, Federal, State, County, and City. Many government agencies have jurisdiction on BNSF property.

The responsible department or general contractor performing the work must obtain all permits before the start of the project. Personnel in charge of the work must ensure that the proper permits have been obtained and are in place before any work is performed.

Permits are normally processed within 60 days. Construction permits can take from several months to 1 year depending on the agency. Some permits will require public notification and public hearings, and may take up to 1 year or more to implement.

Note: Plan work in advance to have enough time to obtain the proper permits. Plan work for potential work restrictions, such as "fish windows" in the Pacific Northwest region. The work restrictions will dictate when work can be performed in and next to the different bodies of water.

Note: This document is to assist the field forces and may not include all permits to be in compliance with all permitting agencies; permit requirements vary from state to state.

Note: Fines, penalties, and in some cases imprisonment could be levied against the company and individuals responsible for the project.

Consultants and others can be hired to help obtain the proper permits. If you are uncertain if a permit is required, seek help from BNSF Engineering Services. For a list of consultants in your area, contact your BNSF Engineering Services office.

Types of Projects (Note: This list is not all-inclusive.)

Bank-widening	Culvert extensions
Channel changes	Ditch widening or cleaning
Replacement of bridge structures	Grade stabilization
Access road construction	Placement of rip rap
Construction of any type of berms	Derailment clean-up
Crossings installed at creeks or streams	Vegetation control
Pole line removals	Brush cutting
Undercutting	Mud slides
Flooding	

Note: For emergency work (i.e. derailments, washouts, slides, etc.) first contact the Service Interruption Desk.

For more information, refer to the State and Local Permit Policy in Appendix A of this Engineering Instruction.

24.5.7 Fiber Optics

Installing, adjusting, relocating, or adding to, any fiber optic placed on BNSF property is prescribed by the Utility Accommodation Policy and governed by the same provisions as those for electric power, telephone, telegraph, cable television, water, gas, oil, petroleum products, steam, chemicals, sewage, drainage, irrigation, and other similar lines.

If the railway company determines that the location of the fiber optics systems on Company property must be changed to accommodate the railroad:

1. The railroad must notify the fiber optic company of plans in writing and use reasonable efforts to secure an alternative location for the fiber optic system.
2. The fiber optic company must move the affected fiber optic system to the alternate location at its own expense as soon as practical.
3. If the railroad wishes the fiber optic company to move the railroad conduit system simultaneously with the move of the fiber optic system, the railroad must request so in writing and the fiber optic company will invoice the railroad for the incremental costs.

24.5.8 Electrical Work

A. Electrical Equipment Inspection

Electrical work performed by a contractor must be inspected by the contractor using the Electrical Inspection Form (see Figure 24-15) and provided to the BNSF Project Manager. Personnel performing the inspection must be qualified and follow all National Electric Code (NEC) requirements.

B. Lockout/Tagout

When transferring the control of electrical equipment installed by a contractor, the contractor must use the Lockout/Tagout Transfer Form (see Figure 24-16). Personnel using this form must be qualified and follow all NEC requirements.

BNSF RAILWAY

Revised 06-19-09

Engineering Services

Electrical Inspection Form

Inspection #	Date

Electrical Equipment Information	Project
Equipment name:	
Item tag number:	**Location**
Manufacturer:	
Type of class:	**Inspector's Name**
Application:	
Installation location:	**Inspector's Signature**
Voltage rating:	
Ambient conditions:	

No.	Inspection Item	Pass/Fail	Required Action	Date Corrected	Initials
1.0	**WIRES AND CABLES**			/ /	
1.1	Cables used are undamaged and less than 2 years old			/ /	
1.2	Cables are sealed against moisture on both ends			/ /	
1.3	Cables are approved for indoor/outdoor use			/ /	
1.4	Cables, fillers, and binding contain no asbestos			/ /	
1.5	Conductor insulation type and rating is correct			/ /	
1.6	Conductors are installed in concealed raceways			/ /	
1.7	Conductor and conduit size are correct			/ /	
1.8	Conductor insulation is color coded and appropriate			/ /	
1.9	Power conductors are minimum No. 12 AWG			/ /	
1.10	Control conductors are minimum No. 14 AWG			/ /	
1.11	Wires, conductors, cables are single conductors			/ /	
1.12	System color coding displayed on wiring diagrams			/ /	
1.13	Color coding is consistent the full length of conductors			/ /	
1.14	Switch leg wiring color-coded to match phase			/ /	
1.15	Joints & splices are equivalent to conductor			/ /	
1.16	Lugs are solderless type UL for copper wire use			/ /	
1.17	Connectors for branch circuits & joints are correct			/ /	
1.18	Wire connectors are used correctly			/ /	
1.19	Terminals arranged in correct phase order			/ /	
1.20	Grounding coductor size and color is correct			/ /	
1.21	Compression splicing used for permanent connections			/ /	
1.22	Control cables have sufficient slack			/ /	
1.23	Ties and support used for excess cable slack			/ /	
1.24	Circuit numbers identified for wires and cables			/ /	
No.	**Inspection Item**	**Pass/Fail**	**Required Action**	**Date Corrected**	**Initials**
2.0	**GROUNDING**			/ /	
2.1	Minimum conductivity of 97% on all grounding cables			/ /	
2.2	Ground rods are made of copper or copper-clad steel			/ /	
2.3	Ground rods are of the correct diameter			/ /	
2.4	Ground rods installed vertically and to the correct depth			/ /	
2.5	Ground conductors laid at correct depth below grade			/ /	
2.6	Grounding connections have correct type & configuration			/ /	
2.7	Equipment properly grounded			/ /	
3.0	**ELECTRICAL IDENTIFICATION**			/ /	
3.1	Electrical distribution identified by nameplates & labels			/ /	
3.2	Control equipment identified by nameplates & labels			/ /	
3.3	Conductors & conductor bundles marked correctly			/ /	
3.4	Conduits identified correctly and frequently			/ /	
4.0	**UNDERGROUND ELECTRICAL WORK**			/ /	
4.1	Conduit is of correct material and schedule			/ /	
4.2	Conduit and fittings are of correct type and size			/ /	
4.3	Metal conduit connections are correct for PVC			/ /	
4.4	Underground conduit joints are watertight			/ /	
4.5	Concrete encasing uses correct duct utility			/ /	
4.6	Cable rack used is of correct material and type			/ /	
4.7	Pull cable used is of correct material and tensile strength			/ /	
4.8	Pull cable has sufficient slack at the end of conduit			/ /	
4.9	Man-holes & hand-holes are of correct type & configuration			/ /	
4.10	Man-hole & hand-hole covers are of correct type & schedule			/ /	
4.11	Man-hole & hand-hole covers are labeled appropriately			/ /	
4.12	Concrete class used is correct for encasement			/ /	
4.13	Trenches are backfilled with correct material and method			/ /	

Figure 24-15. Electrical Inspection Form

4.14	Un-encased conduit/duct is installed at correct depth			/ /
4.15	Un-encased conduit/duct is marked appropriately			/ /
4.16	Conduit is clean and terminated appropriately			/ /
4.17	Un-used conduit lines are sealed and capped			/ /
5.0	**PADMOUNTED TRANSFORMERS**			/ /
5.1	Transformer equipment is undamaged and of correct type			/ /
5.2	Equipment rating is clearly displayed and available			/ /
5.3	Equipment includes all special tools and extra products			/ /
5.4	Impedance voltage and load loss is correct			/ /
5.5	Dielectric tests are performed			/ /
5.6	Audible sound level is within specifications			/ /
5.7	Short circuit capability has been tested			/ /
5.8	Telephone influence factor is within specifications			/ /
5.9	Zero-phase-sequence impedance voltage is correct			/ /
5.10	Temperature rise is within specifications			/ /
No.	**Inspection Item**	**Pass/Fail**	**Required Action**	**Date Corrected**
5.11	Insulating liquid samples tested			/ /
5.12	Equipment is installed plumb and level			/ /
6.0	**STANDBY EMERGENCY GENERATOR SYSTEMS**			/ /
6.1	Equipment complies with manufacturer qualifications			/ /
6.2	Electric generating system conforms to NEC standards			/ /
6.3	Transfer switches labeled under UL 1008			/ /
6.4	Engine conforms to specified temp., fuel, and power specs			/ /
6.5	Alternator has correct kW rating and meets NFPA specs			/ /
6.6	Electric plant is mounted on vibration isolators			/ /
6.7	Engine alternator controls meet with installation specs			/ /
6.8	Safety shutdown monitoring system meets design specs			/ /
6.9	Equipment contains a complete engine start-stop control			/ /
6.10	Engine-genator is enclosed in a weather protective enclosure			/ /
6.11	Exhaust silencer provided is of correct grade and size			/ /
6.12	Automatic transfer switch is of correct type and configuration			/ /
6.13	Safety shutdown operates properly			/ /
6.14	Single step load pick-up tests appropriately			/ /
6.15	Transient and voltage dip responds appropriately			/ /
6.16	Steady state voltage and speed (frequency) is within specs			/ /
7.0	**EXTERIOR LIGHTING**			/ /
7.1	Luminaires comply with specs and UL standards			/ /
7.2	All light fixtures are free of damage			/ /
7.3	Metal parts are free of burrs and sharp edges			/ /
7.4	Housing structure and fixtures are effectively weather-proof			/ /
7.5	Reflective surfaces have minimum reflectance per specs			/ /
7.6	Poles and support structures meet load and wind specs			/ /
7.7	Poles & support structures assembled & seated correctly			/ /
7.8	Lowering system for luminaires operates correctly			/ /
7.9	Lamps installed & adjusted properly			/ /
7.10	Metal components properly treated for corrosion			/ /
7.11	All poles and support structures properly grounded			/ /
7.12	Lighting units verified for normal operation			/ /
7.13	Light intensity for light fixtures meets specifications			/ /
8.0	**PANELBOARDS**			/ /
8.1	Components and installation comply with NFPA 70 standard			/ /
8.2	Electrical components are UL listed and labeled			/ /
8.3	Installation work follows NEIS standards			/ /
8.4	Directory is complete and legible			/ /
8.5	Circuits are identified correctly and effectively			/ /
8.6	Main CB/MLO complies with MCC schedule			/ /
8.7	Breakers meet panel schedule for size & performance			/ /
8.8	Panelboard interior is properly mounted and reinforced			/ /
No.	**Inspection Item**	**Pass/Fail**	**Required Action**	**Date Corrected**
8.9	Enclosure is weather-proofed and properly grounded			/ /
8.10	Main bus complies with rating, voltage, and amperage			/ /
8.11	Ground and neutral bus meet schedule and specs			/ /
8.12	Bus bar complies with conductivity and rating specifications			/ /
8.13	Circuit breakers are of correct composition and duty type			/ /
8.14	Equipment effectively guarded from foreign matter & moisture			/ /
9.0	**SWITCHBOARDS**			/ /
9.1	Components and installation comply with NFPA standards			/ /
9.2	Electrical components are UL listed and labeled			/ /
9.3	Installation work follows NEIS standards			/ /
9.4	Unit and all brach devices are labeled correctly			/ /
9.5	Circuits are identified correctly and effectively			/ /

Figure 24-15. Electrical Inspection Form (Cont.)

9.6	Main CB/MLO complies with MCC schedule			/ /	
9.7	Branch breakers meet size & performance schedule			/ /	
9.8	Enclosure is weather-proofed and properly grounded			/ /	
9.9	Main bus complies with rating, voltage, and amperage			/ /	
9.10	Ground and neutral bus meet schedule and specs			/ /	
9.11	Equipment effectively guarded from foreign matter & moisture			/ /	
10.0	**MOTOR CONTROL CENTERS**			/ /	
10.1	Components and installation comply with NFPA standards			/ /	
10.2	Electrical components are UL listed and labeled			/ /	
10.3	Installation work follows NEIS standards			/ /	
10.4	Unit and all brach devices are labeled correctly			/ /	
10.5	Circuits are identified correctly and effectively			/ /	
10.6	Main CB/MLO complies with MCC schedule			/ /	
10.7	Branch breakers meet size & performance schedule			/ /	
10.8	Motor starters comply with MCC schedule and specs			/ /	
10.9	Motor starters comform to size and type requirements			/ /	
10.10	Enclosure is weather-proofed and properly grounded			/ /	
10.11	Main bus complies with rating, voltage, and amperage			/ /	
10.12	Ground and neutral bus meet schedule and specs			/ /	
10.13	Equipment effectively guarded from foreign matter & moisture			/ /	
11.1	**RECEPTACLES**			/ /	
11.2	Components and installation comply with NFPA standards			/ /	
11.3	Electrical components are UL listed and labeled			/ /	
11.4	Installation work follows NEIS standards			/ /	
11.5	Cables/wire feeds are installed & labeled correctly			/ /	
11.6	Circuits are identified correctly and effectively			/ /	
11.7	Cables/wires tested for voltage, amperage, and polarity			/ /	
11.8	Grounding installations are correct and effective			/ /	
11.9	Equipment enclosures consider use GFCI receptacles only			/ /	

Figure 24-15. Electrical Inspection Form (Cont.)

Engineering Services
Lockout/Tagout Transfer Form

*** Form must be completed within 24 hours of removing, changing, or replacing original lock. Completed form must be submitted to BNSF Project Manager.**

Project:	**Date:**
Location:	**Inspector:**
ORIGINAL LOCKOUT INFORMATION	
Lockout Tag Number:	**Date:**
Authorized Employee:	**Time:**
Lockout Location:	
Reason for Lockout:	
Affected Employees:	
Hazardous Energy Type: (Electrical, Mechanical, Hydraulic, Air, Gravity, Other)	
Hazardous Energy Location:	
LOCKOUT MODIFICATION	
Authorized Employee:	**Date:**
Supervisor:	**Time:**
Action: (removed, changed, replaced lockout)	
Reason for Change or Transfer:	
Were All Affected Employees Informed Prior to Change or Transfer?	
If not, state reason why?	

Figure 24-16. Lockout/Tagout Transfer Form

24.6 Construction Standards

24.6.1 Grade Separations/Highways Over Railroads

A. Vertical Clearance

Ensure at least 23 feet 6 inches from the top of the rail of existing track, or for future tracks to the lowest member of the structure; however, as much as practical is desired. The minimum clearance for subdivisions where electrification is planned is 26 feet 0 inches. Temporary clearance for false-work can be reduced to 21 feet 6 inches with regulatory approval. See Drawing No. 2509 in the Standard Plans for Trackwork (BNSF minimum clearance diagram). C/L track can refer to C/L track or future track.

B. Horizontal Clearance

As much as practical is preferred, but should be no less than 25 feet from the centerline of the nearest track or future tracks. Where this is not possible, clearance can be reduced to not less than 15 feet 0 inches for new construction. If the track is on a curve, add 1 foot for curves 0 to 4 degrees; add 2 feet for curves 4 to 8 degrees; add 3 feet for curves over 8 degrees. Horizontal clearance must be increased to provide a maintenance roadway in most locations. Also refer to section 24.6.4 (Crash Walls to Protect Columns of Overhead Structures).

C. Drainage

Do not subject the track structure to ponding or concentrated runoff from the highway pavements. When designing the highway embankment and bridge deck, make provisions to carry storm water runoff away from the track(s). Do not discharge runoff from pavements onto the railroad right-of-way.

D. Utility Lines

BNSF discourages any utility line attachment to an overhead structure. Under no circumstances shall pipelines carrying liquid substances be attached to or hung from an overhead structure. If a utility line is authorized for attachment to an overhead structure, cover it by a separate license agreement.

E. Seismic Design

One of the greatest hazards to a railroad as a result of seismic event is the potential for overhead structures to fall onto the track. New construction must be designed to withstand the appropriate seismic forces for the area.

F. Signal Sight Distance

Railroad signals are strategically placed to provide ample sight distance to trainmen for subdivision operating speeds. If a new overpass is constructed that could impair the sight distance, an additional signal or relocation of an existing signal may be required.

24.6.2 Grade Separations/Railroads Over Highways

A. Design

Refer to the current AREMA Manual. Design loading is Coopers E-80 with diesel impact. BNSF prefers simple spans rather than continuous spans over piers. BNSF prefers to avoid through girder design whenever possible. For steel structure design, refer to BNSF General Requirements for Steel Construction. Avoid field structural welding whenever possible.

B. Shoofly Track

Design speed should be as near subdivision speed as practical. The shoofly design should give as much clearance as possible to the construction site. The greater the clearance, the less potential for construction equipment and/or personnel to be involved in a train incident. Other benefits may include eliminating retaining walls and reducing flagging costs, train delay, etc. Signal sight distance is often neglected in shoofly design.

C. Quality Control Inspection

BNSF will require quality control inspection for every component of the structure subject to railroad loading. BNSF will place an inspector at the job site in spite of other inspectors present from public agencies. Municipalities often do not have qualified structural inspectors. County agencies are somewhat better. State agencies are usually well qualified. Until certain that competent individuals are performing quality control, BNSF will monitor this activity at the job site.

D. Utility Lines Attached to Railroad Bridges

BNSF does not allow utility lines to be attached to the face of any railroad bridge nor to the bents/columns. Utility crossings are governed by specific regulations outlined in the BNSF instruction manual entitled Utility Accommodation Policy.

It is expressly understood that the right to install utilities is restricted to the placement of underground utilities beneath the roadway surface. Under no circumstances will utilities be allowed behind the abutments, near piers or piles, or hanging from the structure. Utility crossings within the limits of the license area will be covered by separate agreement between BNSF and each of the utility companies. License agreements for utility line crossings may be obtained from BNSF's Property Management Department.

E. Drainage Structures

Storm water drainage structures and pipes are normally covered by license agreement issued by Property Management. Design criteria is covered in the Utility Accommodation Policy.

24.6.3 Utility Accommodation Policy

A. Purpose

This policy describes the accommodation, location, and method of installing, adjusting, removing, relocating, and maintaining utility facilities within BNSF property. The policy was developed in the interest of safety, protection, utilization, and future development of BNSF, while considering public and private service from adequate and economical utility installations.

B. Application

The policy concerning utility accommodations shall apply to all:

- New utility installations
- Additions to existing utility installations
- Adjustment and relocation of utilities
- Existing or planned utility installations for which agreements with BNSF were entered prior to the date of the adoption of this policy
- Existing utility installations that do not meet the license requirements but may remain at the discretion of BNSF

Various types of utility lines not specifically discussed in this policy are considered within the provisions of this policy. In general, consider lines carrying caustic, flammable, or explosive materials under the provisions for high-pressure gas and liquid fuel lines.

C. Scope

Utilities include lines, facilities, and systems for producing, transmitting, or distributing communications, power, electricity, light, heat, gas, oil, crude products, water, steam, waste, storm water, and other similar commodities that are privately, publicly, or cooperatively owned and that serve directly or indirectly the public or any part thereof.

A Utility Agreement License allowing a utility owner the privilege of placing its facilities in or on railroad property does not constitute permanent right for such usage. The utility owner will remove, remodel, maintain, or relocate the facilities, whether or not required by BNSF, at no cost to BNSF.

D. Exceptions

BNSF must authorize any exceptions to the design, location, or methods of installation provisions contained in this policy. BNSF will consider requests for exceptions only where extreme hardship and/or unusual conditions justify and where alternate measures can be prescribed to comply with this policy. Fully document requests for exceptions, including design data, cost comparisons, and other pertinent information.

E. Manual

Complete policy details and instructions as well as drawings that depict overhead and under-track clearances are available in the manual entitled Utility Accommodation Policy. Obtain this publication from the BNSF Web site:

http://www.bnsf.com/tools/fieldengineering/pdf/utilacc.pdf

24.6.4 Crash Walls to Protect Columns of Overhead Structures

A. Criteria

To limit damage by the redirection and deflection of railroad equipment, piers that support bridges over railways and that have a clear distance of less than 25 feet from the centerline of a railroad track must be of heavy construction (defined below) or be protected by a reinforced crash wall.

- Crash walls for piers from 12 to 25 feet clear from the centerline of the track must have a minimum height of 6 feet above the top of the rail.
- Piers less than 12 feet clear from the centerline of the track must have a minimum crash wall height of 12 feet above the top of the rail.
- The crash wall must be at least 2 feet 6 inches thick and at least 12 feet long.
- When two or more columns compose a pier, the crash wall must connect the columns and extend at least 1 foot beyond the outermost columns parallel to the track.
- The crash wall must be anchored to the footings and columns, if applicable, with adequate reinforcing steel and must extend to at least 4 feet below the lowest surrounding subgrade.

Consider piers of heavy construction if they have a cross-sectional area equal to or greater than that required for the crash wall, and the larger of its dimensions is parallel to the track.

Consider providing protection for bridge piers over 25 feet from the centerline of the track as conditions warrant. Take into account such factors as horizontal and vertical alignment of the track and embankment height. Also, assess the consequences of serious damage in case of a collision.

B. BNSF Requirements

BNSF will require crash wall protection for a structure member within 15 feet of the centerline of the track, regardless of the definition of "heavy construction." There are always exceptions, however, all future designs for structures within 15 feet of the centerline of a BNSF track should include a crash wall.

C. Crash Wall Retrofit

BNSF will not require retrofit of current structures that may fall within the crash wall criteria; however, any new construction will require a crash wall. If the new construction involves widening an existing structure that does not have crash walls, then protect new and existing piers/columns by crash walls. The local unit of government may require a retrofitted crash wall if BNSF adds track at that location.

24.6.5 Signal Berms

A. Scope

Evaluation of signal berms and associated construction area sizes has produced some basic guidelines to consider in new construction processes. Focus on the platform area required to build turnouts and place and maintain signals after construction is complete. Also, consider placement of propane tanks, generators, and maintenance road access before construction.

Below are three conditions that cover most situations encountered in normal construction of berms for a capacity expansion project. Note that each of these plans states, "the dimensions should be revised in areas of high fill and restricted right-of-way with the approval of the BNSF Engineer."

- Signal House Berm. See Standard Plans
- No. 24 Turnout Construction Berm. See Standard Plans
- No. 24 Double Crossover Berm. See Standard Plans

24.6.6 Typical Cross Sections

A. Double Main Track With 15' 0" Track Centers

See Standard Plans.

B. Double Main Track With 15' 0" Track Centers and 13' 0" Access Road

See Standard Plans.

C. Double Main Track With 25' 0" Track Centers

See Standard Plans.

D. Double Main Track With 25' 0" Track Centers and 13' 0" Access Road

See Standard Plans.

E. Single Main Track

See Standard Plans.

F. Single Main Track With 13' 0" Access Road

See Standard Plans.

Appendix A

STATE AND LOCAL PERMIT POLICY

Updated January 2, 2007

A. INTRODUCTION

This memorandum outlines BNSF Railway Company ("BNSF") procedure regarding compliance with state and local permit requirements systemwide.

B. FEDERAL PERMIT PROCEDURE

All BNSF construction and maintenance activities must comply with federal environmental and permitting requirements. The most common federal permits required are those of the U.S. Army Corps of Engineers (Corps). Federal permit compliance is generally well understood, however, questions, if any, concerning federal requirements can be directed to your respective AVP-Line Maintenance, AVP – Engineering Services or AVP-Environmental. Emergency situations that require prompt action trigger a different procedure with the Corps, which is discussed below.

The federal government has in some cases delegated responsibility to state officials for administering federal laws. For example, a state environmental agency may be responsible for certifying that federal permits comply with water quality standards established under section 401 of the federal Clean Water Act.

C. PREEMPTION OF STATE AND LOCAL PERMITS

In general, federal law relating to railroads preempts state and local zoning, land use, environmental and construction permitting. However, courts have held that a railroad may waive the preemption by voluntarily submitting to a state or local jurisdiction's permitting requirements. Once waived, the permit conditions may be deemed contractually binding. BNSF's policy with respect to state and local permitting requirements is designed to satisfy state and local governments that BNSF projects are designed and constructed in a safe and appropriate manner while avoiding submitting to state and local jurisdictions' permitting requirements.

Our permitting procedure depends on whether the work is construction or maintenance and repair in nature. For construction work, our procedure is to proceed with the substantive requirements of the permitting process at the local and state level while making clear that we are doing so only as an accommodation and not as a submission to their jurisdiction. See Item D below for further explanation. For maintenance and repair work, notify the relevant state and local agencies of planned work if that work would have required a state or local permit if there was no federal preemption. See Item E for further explanation.

Where construction or maintenance and repair projects include elements that would ordinarily require permits and compliance with standard building, electrical, or fire codes, those codes (or better) must be met. Ordinarily such standard "building" permits should be secured. The critical concern is that the state or local agency may attempt to condition the issuance of such permits on enforcement of certain environmental requirements, such as preparation of an Environmental Impact Statement. BNSF's policy is to build its facilities to meet or exceed the public health and safety

requirements of standard codes applicable at the time of construction. If, however, state and local agencies seek to use these codes to circumvent construction, projects may proceed without permits, but should meet or exceed code standard. If this situation occurs, the AVP-Engineering Services must be contacted for guidance.

D. CONSTRUCTION

At the outset of each construction project, BNSF staff should identify permits which would ordinarily apply and evaluate whether there may be undue delays or excessive costs incurred (not just minor inconvenience) if the project is progressed by seeking permits due to (1) sensitive areas; (2) public land acquisition; (3) compliance with the National Environmental Policy Act ("NEPA") or similar state law requiring an environmental impact statement or comparable study; or (4) state or local permitting requirements. We expect that in most instances this will not be the case, and staff and consultants should follow state and local permitting requirements, unless and until it appears that this approach could result in undue delays or costs. In some instances, engineering alternatives may be considered to avoid sensitive areas, application of NEPA or permitting requirements. In order to avoid an argument that BNSF has submitted to a state or local government's jurisdiction, staff should make clear at the outset that BNSF is voluntarily working with the jurisdiction in order to be a good corporate citizen and neighbor but is not waiving any federal preemption. A statement to the effect that BNSF is not waiving any federal preemption or submitting to the state or local government's jurisdiction should be included as part of any permit application or correspondence. If at any time it appears that state or local permitting could result in undue delays or costs, BNSF staff should consult with the Law Department to determine how to proceed in light of potential federal preemption in the area. Even where federal preemption is determined to be used to avoid state or local permitting regulations, staff and consultants should work with local and state officials to identify reasonable mitigation measures to address environmental impacts of BNSF construction projects.

In most cases projects have enough "lead time" and permitting should not present a major problem. Additionally, environmental consultants will provide guidance on major projects or projects in sensitive areas. The Law Department is available to consult regarding NEPA compliance issues. Emergency responses present more challenges. See Item F below for a discussion of emergencies.

For purposes of permitting, construction includes new roadbed or any grading work to support the installation of new facilities; new bridges, culverts, and buildings; and new electrical, signal and communication facilities or new above ground or underground fuel storage tanks. Replacement of existing facilities with similar ones, such as bridges and culverts are not considered new construction.

E. MAINTENANCE AND REPAIR

Maintenance and repair work frequently does not require local or state permits, even without preemption (so long as materials aren't placed into waters or defined wetlands). In some cases, federal permits may be needed, particularly if working in or around water, floodplains, wetlands or when activities could impact storm-water runoff or result in deposit of fill material into wetlands or waterways. Permits and advance notifications are also required for maintenance, repair or demolition for any structure where asbestos or lead based paint are present. Where the maintenance is planned and routine, staff or consultants should notify relevant state and local agencies of planned work if that work would have required a state or local permit if there was no federal preemption.

It is company procedure to address the substance of state and local requirements by using "best management practices" to minimize possible environmental harm, and to reasonably mitigate impacts on the natural environment. Questions, if any, should be directed to your Manager Environmental Engineering or his designee. For emergencies see Item F below.

For purposes of permitting, maintenance and repair work includes all normal track maintenance (rail relay, tie replacement, surfacing, undercutting, etc.), cleaning drainage systems (bridges, culverts, ditches, etc.), replacing existing bridges and culverts, and replacing signal and communications facilities. Major/non-routine work involving bridges over navigable waterways may require U.S. Coast Guard consultation or permitting and the Law Department should be consulted on such matters.

F. EMERGENCY REPAIRS AND RESPONSES

When events require immediate response (i.e., mudslides across a track; a bridge washout, etc.) the Corps of Engineers may authorize an emergency permit. Securing an emergency permit requires immediate notification of the Corps. The notice should identify the location and generally describe the required response. The process for notifying the Corps is to advise the Manager Engineering (or their designee), who in turn will manage all direct communication with the Corps during emergencies and will also coordinate with state officials if required. Communication with the Corps should be by any reasonable means and followed by written confirmation of the time and date of the notice.

As time permits, or if contacted by local officials, emergency site supervisory personnel may wish to discuss BNSF's emergency response with appropriate local officials (such as municipal engineers, emergency management officials, or public health and safety officials) to maintain good working relationships. It is company procedure to cooperate with state and local officials in carrying out emergency responses, however, the first order of business is the immediate health and safety of our employees and then to reopen rail service to regular operation levels.

G. CONCLUSION

Permitting various types of work systemwide can be complicated. At the same time, BNSF is obligated by federal law to maintain its rail service with minimal disruption. The prompt resumption of service is not optional, it is a requirement. Adherence to "best management practices" to minimize impacts on the natural environment is also an obligation and our corporate policy. By analogy -- all construction and maintenance activities must maintain high standards of worker safety. High standards of environmental protection must also be maintained by BNSF on its projects. The purpose of this memorandum is to make sure that construction, maintenance, and emergency work goes forward in a safe and timely way, meets substantive environmental requirements and complies with BNSF permitting procedures.