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Section 2.48  Nail Gun Policy
Section 2.49  Reciprocating Saws
Section 2.50  Rotohammers
SECTION 1.1  TIRE CHOCKS

The use of tire chocks reduces the potential for equipment and/or vehicle runaway incidents.

Each motor vehicle identified with the prefix “03” equipment number should be equipped with and utilize a wheel chock or blocking device (measured 4”x4” or larger) whenever it is parked or left unattended. When used, these chocks need to be of sufficient dimensional characteristics to prevent the wheel from easily rolling over the device in either direction.

Subcontractor or outside rented units with ratings commonly referred to as a “1-Ton” or greater should also be required to adhere to this policy.

Other towed equipment such as generators, tool trailers, or compressors should also have the wheels chocked before it is unhooked from the tow vehicle.

Equipment having outriggers or attachments such as RT cranes, Pettibones, or light plants should have at least one outrigger or the attachment down and making sufficient contact to prevent uncontrolled movement. (It is recommended that the left front outrigger be used on RT’s and Pettibones as they are visible during the operator’s approach to the cab. The two front outriggers should be deployed on light plants.)

An alternate to wheel chocks for haulage trucks would be parking them with the front wheels in a specially cut ditch. This approach would require Project Manager’s approval.
SECTION 1.2  OUTRIGGER PADS (Hydraulic Cranes)

Operate all cranes and lifting equipment in accordance with the manufacturer’s recommendations and safe construction practices.

Rough terrain cranes often require the use of additional supporting material under the standard outrigger float. In areas where such additional support is required, a job built or after market pad will be used.

Outrigger pads shall be made from substantial material and sandwiched between a plywood outer skin. Construction of these pads is to follow sound engineering practice for load distribution. Job built pads must have their design and material selection reviewed by the District Engineer or District Equipment Manager prior to fabrication.

Methods for determining blocking area:

- Crane capacity (tons) / 5 = minimum blocking area (sq. ft.) per float (preferred method).
- Area of float (sq. ft.) x 3 = minimum blocking area (sq. ft.) per float.
- Note: these calculations are for “average” soil conditions, which may be inadequate for specific, heavy load conditions.
  - Average soil conditions will require matting and blocking.
  - Backfill, mud and peat are NOT average soil conditions.

Rough terrain cranes set-up to work on firm level surfaces such as asphalt or concrete surfaces may not normally require (but is recommended to protect the floats) the use of an additional pad. However the superintendent shall confirm that there are no subsurface utilities which may be damaged from any such loading.

Areas requiring the use of more than one pad per outrigger due to varying surface levels shall have a lift plan reviewed by the Superintendent.

Any multi-pad or blocking/cribbing set-up shall be inspected and approved by the superintendent prior to the lift. Blocking should not be constructed any higher than 3 lifts, whether it’s constructed from 4x4’s or 12x12’s.
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SECTION 1.4  BOOM AND WIRE ROPE INSPECTION

All cranes and lifting equipment shall be operated in accordance with the manufacturers’ recommendations and existing Kiewit safety policies.

The following Best Safety Practices will be used to prevent and identify boom damage and damage to wire rope used on our cranes. In addition to regular daily crane inspections, a monthly crane boom and wire rope inspection should also be conducted.

**Crawler Crane Travel Recommendations**

1. All load lines should be tied back with double tie-back chokers during travel (see Section 2.8, D.).

2. The crane operator must visually inspect for proper wire rope reeving after traveling and prior to continued operation. The use of binoculars is recommended for those cranes that cannot easily boom down.

**Monthly Crane Boom Inspections**

Crane booms should be laid down once per month to be thoroughly inspected, and their components greased (weekly if the tip sheaves are the greasable type). This boom inspection should be documented on the Daily/Monthly Inspection Form. Any condition that prevents the safe operation of a crane should be immediately brought to the attention of project management and the District Equipment Manager.
SECTION 1.5   HAND PROTECTION GUIDELINES

Selecting the Right Glove for the Task

In a construction work environment, a worker’s hands are exposed to countless physical hazards. Many hazards can be mitigated/reduced by wearing gloves, therefore gloves will be required for the following work tasks:

- Torch cutting or welding,
- painting,
- using chemicals; including caustics, acids and/or solvents,
- handling sharp materials,
- cleaning up scrap,
- handling lumber,
- doping or wrapping pipe, or
- any other activity which may expose an employee’s hands to an injury.

Work gloves do not protect the hands from all types of injuries and they are not a substitute for safe work practices and engineering controls. Employees must do their part to prevent injuries. This not only includes keeping hands out of pinch points, crush points and burning situations at all times, but also requires employees be able to select the right glove for the task. Furthermore, foremen and superintendents should select the best glove for the work activity during the planning stages and include in the Job Hazard Analysis.

All gloves offer some degree of protection, with advantages and disadvantages associated with all types of gloves. Each operational hazard analysis that identifies a risk of injury to the hands should require a specific type glove for protection. Superintendents and foremen should secure multiple quotes to ensure the best possible pricing. For select suppliers, contact the District Safety Manager or the project’s purchasing agent.

Below are recommended glove types for several operations that require gloves:

Material Handling – Carpenter Work

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<tr>
<th>TYPE</th>
<th>APPLICATION</th>
<th>ADDITIONAL REQUIREMENTS</th>
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<tbody>
<tr>
<td>Industrial Gloves 100% Leather</td>
<td>Material Handling. Limited puncture resistance. Absorbs some impact. Shields against sparks and provides some thermal resistance.</td>
<td>Little or no resistance to chemicals and other hazardous liquids. No burning or welding.</td>
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<tr>
<td>TYPE</td>
<td>APPLICATION</td>
<td>ADDITIONAL REQUIREMENTS</td>
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<tr>
<td>Latex Palm (Atlas #305) Good for carpentry and housekeeping tasks.</td>
<td>Good for carpentry and housekeeping tasks. Provides excellent wet grip, puncture and abrasion resistance.</td>
<td>No resistance to chemicals and other hazardous liquids. No burning or welding.</td>
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<th>TYPE</th>
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<th>ADDITIONAL REQUIREMENTS</th>
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<tbody>
<tr>
<td>Cold weather work gloves</td>
<td>For construction, warm hands mean increased productivity and fewer injuries. Mild heat resistance and abrasion protection. Good for construction work.</td>
<td>Check the gloves before wearing to make sure they are not cracked, torn, or damaged in any way. No burning or welding.</td>
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<tr>
<td>Clean grip gloves with PVC dot coating</td>
<td>Better grip and abrasion resistance. Good for material handling and general maintenance and carpenter work. Good in a warm climate.</td>
<td>No resistance to chemicals and other hazardous liquids. No welding or cutting. No impact protection.</td>
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Material Handling – General

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<tr>
<td>Chore Glove</td>
<td>Good grip and abrasion resistance. Good for material handling and general maintenance work.</td>
<td>No resistance to chemicals and other hazardous liquids. No welding or cutting. No impact protection.</td>
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## Maintenance Work

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<tbody>
<tr>
<td>Mechanix Gloves</td>
<td>Synthetic leather palm and index finger. Protect against incidental contact with hot surfaces. Maintenance work. Good sensitivity and dexterity.</td>
<td>They are not flame proof or fire retardant. Do not expose to extreme abrasion, open flame or sparks from grinding. Not water proof. No welding or cutting.</td>
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## Air Tool Work

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<td>Anti-Vibration Liners</td>
<td>Required gear for those who operate an impact hammer or power tools over extended periods. Integral padding acts as a shock absorber to lessen the effects of constant vibration.</td>
<td>Can be worn with standard work gloves. May also buy impact gloves, with padding built in.</td>
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## Concrete Work – Chemical Handling

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<tbody>
<tr>
<td>Premium Double-Dipped PVC</td>
<td>Prevents hand contact with mild chemicals, oils and solvents and strong acids. Good for construction, concrete, mining, petroleum, and refining work.</td>
<td>Check MSDS for specific instructions on which type is needed for protection. Inspect for cracks, tears, or damage before use.</td>
</tr>
<tr>
<td>PVC Coated Gloves</td>
<td>Excellent resistance to most acids, fats and petroleum hydrocarbons. Excellent abrasion resistance. Also good for concrete work.</td>
<td>Check MSDS for specific instructions on protection required. Inspect for cracks, tears, or damage before use.</td>
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### Welding and Cutting

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<tr>
<td>Welder’s Gloves</td>
<td>Protects hands from heat and welding sparks. Excellent touch sensitivity. To be used when cutting/welding.</td>
<td>Inspect for damage. Replace any glove that is torn, worn, cracked, or damaged.</td>
</tr>
<tr>
<td>Leather Palmed Glove with Gauntlet Cuff</td>
<td>Material Handling. Some puncture resistance. Longer life. Absorbs some impact. Shields against sparks and provides thermal resistance.</td>
<td>May be used for light welding and tacking. Inspect for damage. Replace any glove that is torn, worn, or damaged.</td>
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### First Aid

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<tr>
<td>Latex Exam Quality Gloves</td>
<td>Industrial, health care and laboratory applications. Safety office use and all first aid kits and cabinets on site and in vehicles.</td>
<td>Reminder: These are single-use, disposable gloves. Check the gloves before wearing to make sure they are not cracked, torn or damaged.</td>
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### Handling Sharp Objects – Material with Sharp Edges

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<tr>
<td>Steel Mesh Gloves</td>
<td>Material handling. Use during knife and blade sharpening and cleaning, sheet metal work and tinsmithing. Carpenter use when working around sharp edges; such as cutting stayform.</td>
<td>Check the gloves before wearing to make sure they are not cracked, torn, or damaged.</td>
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## Hand Protection Guidelines

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<tr>
<td>Kevlar Gloves</td>
<td>When cut resistance is the main goal. Good dexterity but offers limited thermal resistance. Carpenter use when working around sharp edges, such as cutting stayform.</td>
<td>Check the gloves before wearing to make sure they are not cut, torn, or damaged.</td>
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<tbody>
<tr>
<td>BarriCut Fiber with Ceramic Platelets</td>
<td>Exceptional cut resistance. Good dexterity and are form-fitting. Ideal for metal and glass assembly.</td>
<td>Check the gloves before wearing to make sure they are not cut, torn, or damaged.</td>
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### Electrical Work – High Voltage

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<tbody>
<tr>
<td>Electrical Leather protectors</td>
<td>High – and low voltage, superior puncture, abrasion and moisture resistance.</td>
<td>Contact the District Safety Manager before purchasing or using these gloves. Check voltage for specific instruction on which type you need for protection. Replace if cracked, torn, or damaged. Must test for holes before using.</td>
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### Administration

Foremen and Superintendents are responsible for the administration of this policy.
SECTION 1.6  INSERTS AND EMBEDDED ANCHORAGEs FOR HOISTING

The use of inserts and embedded anchorages for hoisting concrete components is common in structures work. The following communicates items that should be considered when selecting these devices and it also establishes common design standards, procedures and guidelines to prevent failures during hoisting operations.

Anchorage Selection

The following should be considered when selecting the appropriate type of anchorage device.

1. All inserts and embeds should be used in accordance with manufacturer’s recommendations. Care during installation of post installed anchors is critical to their performance. Excess dust, moisture, hole diameter, temperature (primarily for epoxy anchors), etc. can all have an impact on the performance of the anchor.

2. Embeds and inserts used in close proximity to each other, in thin concrete elements, or near any edge will reduce the allowable loads.

3. The effects of repetitive use of anchorages should be investigated. They can become fatigued or deficient in some other manner without showing visual signs prior to failure. Periodic replacement may be required.

4. Avoid using drop-in or drill-in anchors for hoisting. If their use is necessary, attempt to configure the inserts for shear loading instead of tension loading. The Designer shall consider a capacity reduction for these types of anchors, and appropriately evaluate their use in high strength concretes per ACI 318, appendix D.

5. All possible load conditions, including lateral and impact, must be addressed.

6. High strength materials, such as rods, bolts and strand, exhibit good structural characteristics when used in tension but have very limited shear strength and, as such, should not be used to carry shear loads.

7. Transferring shear loads by mechanical means is better than relying on friction and is the preferred option.

8. Pre-tensioning of the anchorage connections is highly desirable as a method to load and test system components prior to use during hoisting. It is required when friction is used to transfer shear loads.

9. When pre-tensioning is used, the anchorage should be tensioned and locked off at a minimum of 1.25 times the design load or that required to develop adequate friction. Pre-tensioning should occur just prior to hoisting by those making the pick to ensure it is completed and reduce the effects of pre-tensioning losses.

10. Significant anchorage testing may be required to prove adequacy of the design. Individual testing of all anchorages may be required in some circumstances.
**Design Requirements**

A registered professional engineer will design and stamp all hoisting anchorages. The designer shall meet the requirements outlined in the qualifications section of the Districts Falsework and Shoring Safety policy, Section 2.13. When any design reviews are required the reviewer shall meet the same requirements. A copy of the drawings and the calculations shall be maintained on the project site, with the Project Engineer, and a copy of the design drawing, including load rating, should be attached to the Hazard Analysis for the lift.

Additionally, the designer shall consider the following:

1. Standard anchorage systems shall be designed to withstand the forces imposed by its rated load, with a minimum design factor of 3, based on yield strength, for load bearing structural steel components. To comply, use a load factor of 2.0 and design the components according to AISC ASD requirements. The maximum allowable stress per AISC is 0.667Fy. This correlates to a 1.5 factor of safety against yield. Applying a 2.0 load factor will increase the factor of safety up to 3.0. The capacity of the concrete, for designed embedments shall be per ACI 318 Appendix D (2005).

   (The Factor of Safety criterion as specified in the Kiewit Bridge & Marine, Best Safety Practices and Safety Policy Manual, Section 2.30 Design of Lifting Beams and Spreader Bars. This may not be the appropriate factor of safety for embeds and inserts, since it specifically bases the Factor of Safety on yield strength, it appears that it would typically apply to the steel components of a system. In the Cal OSHA Construction Safety Orders, Article 29 Erection and Construction Section 1714 Hoisting and Erecting of Precast, Prefabricated Panels 5b. “Lifting inserts, which are embedded or otherwise attached to precast concrete members, shall be capable of supporting at least 4 times the maximum intended load applied or transmitted to them, and shall be used in accordance with manufacturer’s recommendations.” Since this section applies to precast panels it may be appropriate for other concrete embeds, but the 3.0 to yield may meet this requirement. Additional OSHA or ANSI standards may also control, such as 5.0 factor of Safety on wire rope rigging.)

   Hilti uses safety factors between 4 and 8. Most embeds such as Williams and Dayton Richmond use 4. The design of embeds is also contingent on the combination of shear and tension. Also, ACI and PCI have recently revised the code to adjust the anchorage design criteria. It is imperative that the designer utilize the latest design codes. Per ACI 318 you may want to consider requiring all embedment design be controlled by steel failure.

2. For **HIGHLY** engineered anchorages and lifting systems, with appropriate design, design review, testing, inspection and approval of the Area Manager; minimum design factors of safety may be increased from those listed above.

3. When friction is utilized in the anchorage design, a minimum design factor of safety against sliding of 2.0 or greater should be used with the appropriate coefficients of friction. Testing to determine actual coefficient of friction of the materials is advised to substantiate the design. Pre-stressing losses including creep of connection materials should be considered.

4. The anchorage should be designed as a component of the complete lifting system. All possible load conditions and combinations must be analyzed. Rigging angles significantly impact the design of these items and should be reflected on the design drawings.
5. Pad eyes should be addressed closely. Large anchorages can have significant eccentricities that affect the design. A check of the shackle clearances should be conducted. Cheek plates are suggested on pad eyes to center the shackle and avoid side loading the pad eye.

6. Minimum system testing and inspection requirements and limits on repetitive use should be provided by the designer.

7. Generally, all embeds should be designed for cracked concrete. If no secondary reinforcement is present to control temperature and shrinkage of the concrete, the cracks may become too large and the anchor design will be inadequate. The effects of heat on epoxy adhesives should also be considered in extremely cold or warm environments.

   Also note that steel placed in the concrete transverse to the line of force for a tension controlled anchor, does not provide any additional capacity.

   Currently, ACI 318 Appendix D limits embedment depth to 25” and diameter to 2”. These are based on past research. Note that the depth requirement may eventually be removed from the code.

Procedures and Guidelines

The following should be covered in the operation-specific Work Plan and Hazard Analysis.

1. Anchorage design drawing including the allowable design load.

2. Anchorage installation instructions and inspection requirements during installation.

3. Maximum allowable number of uses and inspection criteria during and between uses.

4. Pre-tensioning procedures and documentation.

5. Establish hold points.

6. Job Superintendent written approval is required before hoisting.

7. Rigging and embed inspection requirements. If multiple leg slings are used, check each leg for the proper length. Uneven leg lengths can lead to overload on a single attachment point.

8. Use of a checklist for each lift facilitates compliance with the procedures.

Administration

The Job Superintendent is responsible for the administration of this policy.
SECTION 1.7  PILE DRIVING EQUIPMENT INSPECTIONS

Pile driving equipment requires constant preventative maintenance to enable safe and productive work. Therefore, equipment should go through an extensive inspection before it is used on our jobsites. This applies to self-performed work and to subcontracted work.

Additionally, the equipment should also be inspected daily. Use the checklist below daily to verify the equipment is ready for work. Subcontractors may use their own form but we need to ensure the equipment is being inspected appropriately to ensure a safe and productive operation.

### Pile Equipment Daily Checklist

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<td>Project:</td>
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#### POWER PACK OR AIR COMPRESSOR

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#### IMPACT HAMMERS

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<td>LEADS FOR CRACKS, LOOSE-MISSING PINS/BOLTS</td>
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### VIBRATORY HAMMERS

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- All rigging and components
- All pressure after clamped to pile
- All bolts after installing first pile
- For missing pins
- Condition of clamp jaws

#### CHECK THESE ITEMS DAILY

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- All hoses and fittings for wear-leaks
- All bolts for tightness
- Condition of elastomers – mounting bolts

#### CHECK THESE ITEMS WEEKLY

- Frame for cracks
- All moving parts

- During sheet pile installation, hammer should be given a “once over” every time it is set down.
- If vibro is laying on the ground, make sure there are no rocks or dunnage stuck to hammer when hoisting each time.
Intentionally Left Blank
SECTION 2.1 PERSONAL PROTECTIVE EQUIPMENT

Where PPE is required, it should be identified in a hazard analysis. The use of PPE must be considered as a last resort for the control of risks, to be used only after all other practicable measures have been taken. Remember that PPE only protects the wearer; and that PPE gives maximum protection only if correctly chosen, fitted and used.

PPE should be chosen that gives:

1. adequate control of any risks identified, without itself adding to the risk;
2. compatibility with other items of PPE (i.e., ear muffs worn with a hard hat must still provide the necessary attenuation);
3. minimum discomfort to the wearer.

It is usually necessary to have more than one type or size of PPE available, so as to maximize the chances of obtaining good fit and comfort. Uncomfortable or unsuitable PPE is unlikely to be worn. Involvement of the user(s) in the selection of PPE is often useful in ensuring the best results.

Job sites should provide some means for PPE to be stored when not in use, so as to protect it from contamination, loss, or damage.

Users must be provided with sufficient information, instruction and training to use PPE effectively (this information is usually provided with the PPE by the manufacturer). Each employee has a responsibility to take reasonable care of PPE and use it according to instructions. Any loss or defect should be reported to a supervisor for replacement.

PROPER CLOTHING

All employees are expected to wear personal protective equipment (PPE) while working on our job sites that affords protection against health and safety risks. This includes, as a minimum, a “T” shirt with sleeves (tank tops or modified shirts are not acceptable); long pants, sturdy work boots that rise above ankle height, and ANSI Z87.1 eye protection. Job office personnel who do not work on site will not be required to wear work boots that rise above ankle height while in the office. Loose or frayed clothes are a hazard and should not be worn.

PROTECTIVE EQUIPMENT

HARD HATS

- Hard hats (with names) are required wear by all employees, visitors, and/or vendors when inside a work area. Bump caps do not provide adequate head protection and will not be permitted on our job sites.

- On our sponsored work, MSA V-Guard hard hats with the District approved logos (purchased through Orr Safety) are required for Kiewit employees. Other style hard hats may be used to adapt to specific PPE needs but must be approved by the District Safety Manager.

- Metal hard hats do not provide adequate protection from electrical hazards and will not be permitted on any job site.

- Cowboy style hard hats do not meet minimum ANSI standards and will not be permitted on any job site.
EYE AND FACE PROTECTION

Basic Eye Protection

- Every employee and visitor on site will wear ANSI approved eye protection at all times while in the field.

- *All eye protection used on our job sites shall comply with ANSI Z87.1 standards.*

Prescription Eyewear

- All employees who wear prescription glasses during work will be required to wear either over the glasses (OTG) safety glasses, Uvex XC (with prescription inserts), or prescription safety glasses (with side shields) that meet the ANSI Z87.1 standards.

Goggles

- Some operations create a greater eye hazard and will require the use of goggles. Some operations where goggles must be worn, include, but are not limited to:
  
  - Exposure to a chemical, which may harm the eyes (i.e. cure spraying, using solvents, jumping batteries).
  - Rock drilling when windy or deemed necessary by the supervisor.
  - When needed for protection from exposure to dust or wind blown sand or from high-pressure washing or the use of a blowpipe.
  - Grinding or drilling on metal where fine particles are present or if the operation is above the eye or overhead.
  - Any other operation where the eyes are exposed to a hazard that produces fine particles, chemical splashes, or fumes.

Face Shields

- In addition to glasses or goggles, operations where face shields must be worn include, but are not limited to:
  
  - High-pressure washing or the use of a blowpipe.
  - Exposure to extremely hazardous chemicals.
  - Grinding.
  - Uses of chipping guns, rivet busters, jackhammers and rock drills.
  - Use of chainsaws and chop saws.
  - Environmental/biological hazards.

- Face shields alone do not provide adequate eye protection and shall be worn in addition to ANSI Z87.1 eye protection or goggles.

Welding Hoods and Safety Apparel

- Welding hoods must be worn when needed. Hoods must be equipped with the proper lens shade for the task being performed. Only welding hoods that adapt to hard hats shall be used.
Employees engaged in overhead welding where severe burn hazards exist shall wear leather gloves, chrome-tanned leather chaps and coats, or a combination of the two to provide adequate protection.

**Burning Goggles and Safety Apparel**

- Burning goggles (5.0 shade) must be worn when using a torch. Gray tint or other shaded safety glasses do not provide adequate protection against ultraviolet light produced in this operation and will not be worn.

- Employees performing routine burning shall wear leather gloves and aprons.

**HEARING PROTECTION**

- Hearing protection is required when working in a noisy environment. Protection is needed when levels exceed 85 decibels. This includes, but is not limited to:
  - Use of chain/chop saws
  - Radial arm saws
  - Jackhammers, Rivet busters, chipping guns
  - Air arcing
  - Use of concrete vibrators
  - Piledriving Operations
  - Grinding Operations
  - Maintenance Activities

- We are required to provide a choice of protection for our affected employees, as some people cannot wear earplugs. Each job shall keep a supply of earmuffs available and provide to employees upon request. *(Note that ear muffs provide reduced noise reduction ratings and may not be appropriate for certain exposures.)*

- Remember that the use of hearing protection, as with any other personal protective equipment, shall only be used after engineering controls have failed. Issuance of hearing protection shall be a last resort, and only after economically feasible engineering controls have been attempted.

- Please review the Hearing Conservation Program for additional requirements and determining exposure durations, etc.

**HAND PROTECTION**

- Gloves must be supplied and worn when working with caustics, acids, solvents, concrete or cement, wood, during housekeeping activities, and when doping or wrapping pipe. *(Consult MSDS and/or initiate the aid of the Project Safety Manager or District Safety Manager when determining appropriate protection for use when dealing with caustics, acids, and/or solvents.)*

**FOOT PROTECTION**

- All employees on site are required to wear foot protection that will comply with ANSI standards. These standards require a boot, of leather construction, that will cover the ankle. Additional foot protection is suggested, and in some cases required, during specific operations. For example, while compacting around a footing with a “Jumping Jack,” steel-toed, or composite toe boots or foot protectors are required. To help minimize the risk of injury to our feet it is suggested that each employee purchase a boot with a composite or steel toe.

- In order to lessen the burden to our employee’s, each project may decide to reimburse current employees (with more than 60 days continuous employment) 50% of the cost of their ANSI
compliant work boots, up to $100.00 (every two years) at the Project Manager’s discretion. The goal of this program is to provide employees high quality, long-lasting, comfortable work boots to protect their feet. In order to receive reimbursement, employees must request permission by filling out the form found at the end of this section.

- Proper fitted rubber boots may be worn when conditions warrant but must always have steel toes and puncture protection inserts. Rubber boots meeting these requirements shall be worn by employees required to work in concrete, and at all times when warranted by a potential hazard. If the concrete has the potential to enter the top of the boot, the boot must be duct taped to prevent any concrete from getting down inside of the boot.

**OTHER**

- Employees operating chainsaws, gasoline-powered hand-held abrasive wheel cutoff saws and other similar type power tools shall wear protective chaps. While cutting metal or material that will throw sparks the chaps must have leather on them to prevent burning or melting of the chaps.
Work Boot Purchasing Program

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Employee has appropriate receipts

Boots are mostly leather

Boots cover the ankle

Boots have a safety toe (composite or steel)

If you’ve answered “No” to any of the questions above, the employee will not be eligible for reimbursement.

Date of Approval to Purchase Boots:  

Tape Receipt Here:

Date of Receipt:

Project Manager Signature:
SECTION 2.2 COMPANY VEHICLES

Kiewit Bridge & Marine parallels the Corporate Policy Manual, Section 4-3 (Company Vehicles).

In addition to the above Corporate Policy, KB&M employees shall also adhere to the following:

- Cell phone use in vehicles should be kept to a minimum with only essential phone calls. Hands free devices are mandatory in all Company vehicles. Texting (or e-mail) and driving is strictly prohibited. Pull over to a safe location if it is necessary to text or e-mail.

- Every Company vehicle should be stocked with a car kit:
  - Camera. (If you have a digital camera or a good camera phone, use it.) Check for expiration date on camera’s with film and make sure it has not expired. Replace as needed.
  - Incident Report “On the Spot”
  - Fire Extinguisher
  - Flares
  - Jumper Cables (recommended)
  - First Aid Kit

Failure to abide by this policy will result in disciplinary action which could involve loss of driving privileges, up to and including termination.
SECTION 2.3 FALL PREVENTION AND PROTECTION

It is our policy to consider any location where a worker is exposed to a fall of six (6) feet or greater as hazardous. Dangerous conditions, such as working over vertical protruding rebar, chemical pits, over or near water, over live traffic, or near high voltage electrical wires, require increased protection.

Protection from falls is to be provided by use of a primary and a secondary means of protection whenever an employee is working at a fall exposure height of six feet or more or if other dangerous conditions exist. In all fall hazard areas, a fall protection plan needs to be implemented.

All fall protection plans must be submitted to the District for approval. Fall prevention and fall protection are two terms frequently used to explain the means to control fall hazards. It should be clear, however, that the two terms are different and should be considered separately. Proper fall prevention totally eliminates a hazardous situation and, therefore, removes the chance of employee exposure to a fall. Fall protection follows recognition that a hazardous condition cannot be fully or adequately eliminated and, therefore, fall arrest equipment is used.

Fall hazards should be approached with these basic principles in mind:

- The best defense against fall hazards is to practice fall prevention and eliminate the circumstances that could allow a fall to occur.
- An employee will work more productively when working at grade or in work areas secured by scaffold and guardrails than when secured by a personal fall arrest system.
- All systems must take into account the potential for at-risk behavior.

Considering these basic principles, approach planning your work at leading or unprotected edges that are six (6) feet or more above a lower level, following this sequence of alternatives in descending order of desirability:

- Perform work at grade, preventing the need for fall protection.
- Secure the work area by a scaffold and guardrail system, eliminating the need for further protective measures.
- Perform work with a motion-restraint system that prevents the employee from traveling to the leading edge or unprotected edge of the work.
- Use a “personal fall arrest system” (PFAS), which will prevent an employee from experiencing a free fall of over six (6) feet in the event of a fall.

In addition to the above requirements, the following are suggested inspection items for jobsites: assure that proper lighting and markings are in place for all walkways and night work activities. Skid resistant coatings should be applied to all walkways.

Please refer to the requirements in the Fall Solutions Manual.
SECTION 2.4 OVERHEAD POWERLINE (HAZARD ANALYSIS and WORK PLAN)

Before work starts on any job where the danger of contacting an overhead powerline exists, an Overhead Powerline Hazard Analysis and Work Plan will be developed.

This work plan shall include:

- Large scale, plan views of the job identifying the location of all overhead power, telephone, and cable lines, etc. The plans should also indicate the location and markings or labels required for all warning signs. These plans should be updated and maintained as determined by job progress, i.e., grade changes, relocation of powerlines, cable installation, etc.

- This plan shall be posted in several locations where employees may review its contents. The plan shall also be communicated to all employees working on a project with overhead powerlines.

- Each location where equipment has the potential to come any closer than 50’ to a powerline shall have a location-specific hazard analysis identifying the voltage, the height off-ground, and the work plan/procedure for all pieces of equipment on the job.

- Equipment and materials should not be stored under overhead lines.

The written policy can be found starting on the next page.
EQUIPMENT TRAVELING OR WORKING NEAR OVERHEAD POWERLINES

1. All work within 50’ of overhead powerlines shall have an operation-specific Procedure and Hazard Analysis. Employee/crew training will be documented and maintained with the procedure and hazard analysis.

2. When it becomes necessary to position equipment for performing work in an area near energized powerlines, the following procedures must be followed if the equipment has the potential to extend, raise, or otherwise move within the minimum safe clearance.
   a. Powerlines should be de-energized or relocated, if at all possible.
   b. If it is possible to have the powerline de-energized, do not start your operations until you have been notified that the lines are dead and the lines are visibly grounded on both sides of the area where the equipment will be working. If the lines cannot be grounded, a representative from the utility company will be present at the start of each shift (or full-time) to confirm that the lines are de-energized.
   c. If the utility owner allows relocation, but will not pay for the relocation, the job must seriously consider paying for relocating the powerlines.
   d. If it is impossible to have the lines de-energized and impractical to have the lines relocated, then the equipment must be prevented from coming any closer than 20 feet for lines up to 50 kV and for lines more than 50 kV, the clearance must be 20 feet plus 0.40 inches for each 1 kV over 50 kV.
   e. Vehicles in transit near energized lines must maintain a minimum clearance distance of 4 feet for lines up to 750V, 6 feet for lines 750V-50 kV, and 15 feet for lines 50kV-345kV. Refer to Section 4-F of the Corporate Crane Procedures Manual for more information.
   f. Positive measures must be installed to prevent working equipment or loads from coming within the required clearance of energized powerlines; such as locking out the boom down or swing motion. For ideas or techniques, please consult with your District Equipment Manager or District Safety Manager. The plan must be written and approved by the Job Sponsor prior to starting the operation. A copy of the written plan shall be provided to the District Safety Manager.
   g. If positive stops cannot be installed, and if there is no less hazardous way to perform the job, and the crane is capable of entering the prohibited zone, the following minimum requirements must be followed:
      - A written plan with specific steps to ensure the crane will not enter the prohibited zone along with a critical lift plan will be completed and reviewed prior to operation; and
      - A Qualified signal person must be assigned to monitor the operation with the sole responsibility to verify the required clearance is maintained. The signal person must be in constant contact with the crane operator; and
      - A salaried superintendent will be present at the crane during the operation with the sole responsibility of verifying all steps of the plan are being carried out and that the specified clearance between the power line and the crane or load is being maintained. It is the superintendent’s responsibility to ensure the power line monitor is qualified to perform this task.
The Job Superintendent is responsible for ensuring that any crane operation is performed in accordance with these statements.

h. Any equipment that has been operating near powerlines must be moved away from the powerline at the end of shift. If this is not possible, a “DANGER – OVERHEAD POWERLINE” sign must be placed on the steering wheel or inside of the windshield of the equipment to forewarn the next operator.

3. On projects where it is necessary to move equipment or loads on access roads adjacent to energized powerlines, the following procedures must be adhered to:

a. De-energize the powerlines if at all possible.

b. A written working procedure for moving the equipment along the access road must be reviewed with the operators and crews.

c. A salaried supervisor must be in charge and remain with the equipment during movement. The salaried supervisor may not delegate his/her responsibility to a foreman or any other person in the crew. However, the salaried supervisor may assign the actual signaling and directing of the movement to a more experienced person.

4. On projects where powerlines cross access roads, and it is necessary for equipment to travel underneath energized powerlines, the following procedures must be followed:

a. Overhead Powerline signs (as shown on Page 5 in this section) must be placed according to the following:

   1. On both sides of the powerline and on the right side of the roadway for roadway widths less than 20 feet; and

   2. On both sides of the powerline and both sides of the road for roadway widths greater than 20 feet. This requires a minimum of 4 signs per location.

   3. In both cases, the signs shall be placed in advance of the lines and not directly below them.

b. If large equipment is present on the job and will pass under overhead powerlines on a frequent basis, a messenger cable should be installed. A messenger cable, if installed, should be located ahead of, and on both sides of the line(s) to assure adequate clearance to the lines for equipment on the job.

   1. The messenger cable should be installed at a height equal to the required clearance distance according to OSHA requirements so that the equipment cannot come in contact with the energized lines, (i.e., if 50 kV or less, the messenger cable should be installed at a height of 20 feet lower than the energized line).

   2. Flags and/or other highly visible ribbon should be installed on the messenger cable.

c. During movement of equipment under overhead lines, do not allow anyone to touch the equipment or any materials the equipment is hoisting or carrying.
5. Temporary powerlines installed for our own use should be placed underground (inside conduit) where there is extensive use of equipment having the possibility of encroaching on the minimum safe clearance distance to overhead powerlines.

6. Supervisors, operators, oilers and all other crewmembers must be thoroughly familiar with these procedures while working in close proximity to energized powerlines. They must be indoctrinated on the correct procedures to follow in the event equipment or loads do make contact with an energized powerline. The following procedures must be followed in the event of contact:

   a. No member of the crew should touch any portion of the crane or the suspended load.

   b. The operator should stay with the equipment and break contact before attempting to leave the controls.

   c. All members of the crew must watch for unexpected collapse of a crane boom, for lines breaking, or loads shifting that might cause them to come in contact with powerlines.

   d. While the equipment is in contact with an energized line, no persons are allowed within a minimum of 40 feet (greater distances are required for lines over 50 kV) of the equipment, as the ground surrounding the equipment may be energized.

   e. The Job Manager and Project Safety Manager (if applicable) must be notified immediately.

      1. The Job Manager or Project Safety Manager shall notify the District Manager and District Safety Manager immediately via live contact.


**Sign Design**

**Minimum Dimension:** 4’ X 4’

**Lettering:**
- **DANGER:** MINIMUM OF 4” White on Red Reflective Background and Black Border
- **LETTERS:** MINIMUM OF 4” Black on White Reflective Background

A red, flashing identification beacon should be mounted on the top of the sign during night work activities.

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**NOTE:** 20’ Clearance is acceptable for lines rated to 50 kV. Additional clearance will be required for greater voltages.
SECTION 2.5  HAZARD COMMUNICATION

Compliance with the requirements of all laws concerning Hazard Communication are followed to ensure that information about the dangers of all potentially hazardous chemicals used, are known by all affected employees and that “Community Right To Know” notifications are made to the appropriate agencies.

Each work location or project shall have a written Hazard Communication Program to comply with the laws. The written program will be available at the job office for review by an employee, employee representative, or OSHA compliance officer. Copies of this program are to be sent to the District Safety Manager. The written program must include the following as a minimum:

A. A hazardous materials inventory list (HMIL), which is an inventory of known chemicals present in the workplace. (Indicate who is responsible for identifying hazardous chemicals, what criteria were used to evaluate the chemicals and a plan for updating your list.)

B. Maintenance of appropriate primary and secondary warning labels on containers of hazardous chemicals. These labels must remain legible.

C. Provide a system to acquire MSDSs when purchasing materials from suppliers. Maintain a binder of MSDSs for all hazardous chemicals at the work location. The binder should include all chemicals in the HMIL and be checked frequently for accuracy.

D. Describe the information and training program and identify the responsible person on the job for assuring compliance. Also indicate how employees are informed about hazards when engaged in non-routine tasks.

E. Develop a plan to exchange or make available all chemical information to other employer’s or subcontractors that may be exposed to chemicals on our sites. Inform each other of the precautionary measures employees need to take to protect themselves during normal operating conditions and foreseeable emergencies.

The job manager, superintendent, or supervisor responsible for this program must assure compliance with the administration of this policy. Please consult the elements of the District Hazard Communication Program when developing the job program.
SECTION 2.6 CONFINED SPACES (ENTRY AND WORK)

This policy is provided for the protection of employees, subcontractor’s employees, and Owner’s representatives.

A job that is required to enter and/or perform work inside confined or enclosed spaces will require a Confined Space Entry Program. At a minimum, the program shall include the following:

1. Evaluation of the job for confined spaces.

2. Marking all confined spaces and restricting access until a program has been established.

If you have questions regarding confined spaces, please consult with the District Safety Manager.

A copy of the state and federal regulations shall be available at each jobsite.
SECTION 2.7  AUTHORIZED OPERATOR POLICY AND PROCEDURES

The use of lifting equipment poses special hazards. To minimize these hazards, we have developed the following policy:

Specific training programs using prescribed manufacturer’s requirements will be used to train authorized operators. Only the following personnel shall operate cranes, forklifts, aerial lifts, and skiffs:

A. Authorized Operator – A trained operator who is assigned to the equipment after it has been determined the operator is qualified and is proficient with the requirements.
   1. Cards will be issued to authorized operators.
   2. This card must remain in the person’s possession while operating the equipment.

B. Trainees – Authorized to operate equipment while under the direct supervision of an authorized operator.

C. Maintenance and Test Personnel – Should be trained in accordance with the requirements of the authorized operator when it is necessary in the performance of their duties.

It is the job superintendent’s responsibility to see that these instructions are followed. Refer to the following Authorized Operator’s Requirements for more information.

Only those persons described above may operate the following equipment:

Cranes (in excess of 2T capacities), forklifts, aerial lifts, and skiffs. The following requirements must be met at all times:

1. Any operator that will operate a Kiewit owned or bare rented piece of equipment on one of our projects is required to have a current authorized operator card. These cards are issued in addition to any certification required or issued by local or state government agencies.

2. Authorized operator cards are issued to the employee when the appropriate form is completed, signed and received by the District Equipment Manager or District Crane Compliance Manager.
   a. Crane operators must be indoctrinated by an Authorized Examiner (AE).
   b. The temporary card should be filled out and given to the operator. The temporary card is valid for a period not to exceed 15 days.
   c. Cards are issued for a specific piece of equipment. Be certain the operator has the appropriate card for the type of equipment he/she will operate. Crane cards are valid for up to 5 years on any Kiewit job. Forklift, aerial lift, and skiff cards are valid for 3 years on all Bridge & Marine projects.
   d. The operator must have the card in his/her possession while operating the piece of equipment.
SECTION 2.8 EQUIPMENT OPERATION POLICIES

A. CRANE & DERRICK OPERATING RULES

Kiewit Bridge & Marine (KB&M) Cranes and Derricks shall be operated and maintained according to standard Corporate Crane Procedures. However, due to the nature of KB&M’s work, some additional rules apply.

1. MAJOR CRANE MOVE PERMIT

All crane moves will be in accordance to the manufacturer’s specifications. A “Major Crane Move Permit” must be filled out by the operator, foreman, and superintendent prior to every major crane move. This permit must be approved by the Job Superintendent before the major crane move can be made. A major crane move includes, but is not limited to:

a. Any move of lattice boom truck crane.

b. Any move of a crawler or RT, which involves unique conditions such as:
   (1) Significant ground slopes.
   (2) Long distance of travel.
   (3) Move at night.
   (4) Overhead or underground utilities.
   (5) Questionable ground conditions.
   (6) Any other uncommon circumstance.

2. USING MULTIPLE HOIST LINES

a. Land based hydraulically controlled cranes can be reeved with multiple lines if all of the following conditions are met:

   (1) The machine must be a 1997 model year or newer.
   (2) The machine must have a Hydraulic operating control system.
   (3) The machine must have a functional Load Moment Limiting (LML) device and Anti-two block system with positive function kick-out that is tested and documented on the daily inspections. Note: Non-functional anti-two block systems require all auxiliary hoist lines to be removed immediately.

b. Conventional cranes such as Manitowoc 3900W, 4100W, American 5299, 9260, 9299, 9310, do not meet the new requirements. These Conventional cranes use air operating systems and the anti-two block systems typically have warning capabilities only, not positive function kick-out. Conventional cranes must follow the guidelines stated below:

   (1) Conventional cranes may be equipped with multiple hoist lines if the current operations require them or they will be required within the next 48 hours.
   (2) If multiple hoist lines are not needed for current operations or within the next 48 hours, the crane must be reduced to a single hoist line. All unused hoist lines will be de-reeved and the wire spooled back on to their corresponding drum.
   (3) The crane must have a functional anti-two block warning device for each line.

3. CRANE BOOM INSPECTION

Crane booms require thorough periodic inspections to ensure their safety. KB&M crane booms will be inspected on the following intervals:
a. Monthly for machines used in lift crane applications.
b. Weekly for machines used in pile driving and duty cycle applications.

4. PARKING CRANES EQUIPPED WITH OUTRIGGERS

When parking Rough Terrain Cranes and Truck Cranes after each use, extend the left front outrigger beam 18-24" and then extend the left front stabilizer cylinder until firmly on the ground. This is an added precaution to prevent the crane from rolling.

5. IDLING POLICY

It is a corporate policy that machines idling for more than 5 minutes must be shut down. Cranes are exempt from this rule only if they have a suspended load on the hook.

Operators on KB&M projects may not leave the cab of a crane that is idling. The crane must be shut off and secured from any movement before the operator exits the cab.

B. FORKLIFT OPERATING RULES

Operation of forklifts will be in strict accordance with the following rules.

1. INTRODUCTION

The use of forklifts is subject to certain hazards that cannot be met by mechanical means, but only by the exercise of intelligence, care and common sense. Therefore, it is essential to have competent and careful operators, physically and mentally fit and thoroughly trained in the requirements for safe operation of the equipment and during handling of loads.

The use of forklifts as general-purpose material handling equipment presents an operational control problem that all supervision should be aware of and responsible for.

2. OPERATORS

a. All operators must be authorized as described in Section 2.7 (Authorized Operator Policy and Procedures).
b. No one, other than personnel specified above shall enter the cab, with the exception of persons such as supervisors, whose duties require them to do so, and then only in the performance of their duties. The operator must acknowledge the individual, ground all loads, set brakes, and shut off the engine prior to entrance of the work area and cab.

c. Make a walk-around inspection to check the condition of the machine and see that everyone is clear, prior to start-up.
d. Check the oil levels and coolant level prior to initial start-up each day.

c. Allow sufficient time for a warm-up period after the engine is started before working the machine.
d. Operators should thoroughly re-familiarize themselves with all controls prior to starting work with the machine.
e. At the start of each shift the operator should test all controls. If any controls do not operate properly they shall be adjusted or repaired before working the machine. Wheel brakes shall be checked for proper operation before moving the machine.
f. The operator should check cables, hooks and other rigging, which might be used with the forklift at the start of shift.

g. The operator should completely fill-out the daily Forklift Visual Inspection form, and turn it into his/her supervisor at the end of each shift.

4. **OPERATION RULES**

   a. **The Machine**

      Rated load capacities, boom angle indicators, recommended operating speeds, special hazard warnings, or other instructions shall be conspicuously posted on all equipment and observed. Instructions or warnings shall be visible to the operator from the control station.

   b. **The Operator**

      1. Shall not engage in any practice that can divert attention while operating the forklift. The forklift operator may not use cellular telephones and/or MP3 style headphones at any time while in the cab of the equipment.
      2. Shall not engage in the operation of equipment when they are physically or mentally unfit.
      3. Shall be responsible for those operations under their direct control. Whenever there is any doubt as to the safety of the operation, the operator shall stop and correct the problem.
      4. Shall familiarize themselves with the equipment and its proper care. If adjustments or repairs are necessary, or any defects are known, they shall report them promptly to their supervisor and shall also notify the next operator of the defects upon shift change.
      5. Shall not hoist, lower, or travel while anyone is on the load or forks.
      6. Shall avoid positioning any load over personnel.
      7. Shall not leave his/her position at the controls while the load is hoisted or suspended.
      8. May not leave the cab until the fork attachment is firmly on the ground and engine is turned off. If equipped, the **left front** outrigger shall be firmly placed on the ground when leaving the machine for extended periods of time.

   c. **Signaling**

      Hand signals shall be posted in visible locations around the jobsite and on the piece of equipment. The operator shall respond to signals from one appointed signal person, but shall obey a “stop” signal at any time no matter who gives it. Standard ANSI hand signals shall be used or signals that have been agreed upon prior to making the lift.

   d. **Traveling**

      When traveling, the boom mast shall be retracted as far as the load will allow. Tying back the load should be considered when traveling with suspended loads. Do not travel on side hills or slopes with a load that will side load the boom.

   e. **Power Lines**

      Refer to Section 2.4 (Overhead Powerline).
f. **Maintenance**

1. The forklift shall be kept in good operating condition at all times. Daily visuals are required and any deficiencies noted must be reported to the appropriate supervisor and corrected prior to operation (unless such operation would not create an unsafe condition).
2. No temporary or permanent modification or additions, which affect the capacity and operation of the equipment, shall be made without notification to the District Equipment Manager. Manufacturer’s written approval is required before making any modification to equipment.

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g. **Rigging To a Forklift**

1. **Extendable Boom Type**
   
   a. **Rigging Method** – Use manufacturer supplied pick plate or tandem fork attachment with engineered center pick point.
2. Carrylift and Straight Mast Type
   

3. Articulated (Frontend Loader) Type
   
a. **Rigging Method** – Same as Extendo Forklift.

4. Skid Steer
   
a. Prohibited

C. AERIAL LIFT OPERATING RULES

The use of aerial lifts pose special hazards since their operation appears simple. Trained, competent and careful operators are essential. This policy applies to manlifts with telescoping booms and scissor lifts.

The job superintendent is responsible for ensuring that these instructions are followed and that the manufacturer, PKS, and regulatory agency requirements are met in their operation, service and selection of operators.

No one other than trained and designated personnel shall operate this equipment. Each designated operator shall be trained in manufacturer, PKS, and regulatory agency rules applying to the equipment prior to starting work. A video to help facilitate this training is available through the Training Department in Omaha. The operator shall possess a valid Kiewit-issued aerial lift operator card prior to starting work and have in his/her possession anytime while operating the lift.

1. **AUTHORIZED OPERATOR’S REQUIREMENTS**
   
a. Manufacturer Requirements

   1. The operator must read and understand the Operation and Maintenance Manuals supplied with (and considered part of) the machine.
2. The operator must be skilled and experienced in the operation of aerial lifts and must be thoroughly familiar with the controls, power system and capability of the specific model.
3. The operator must be in accordance with the capacity charts at all times.
4. The machine must receive regular maintenance and inspection as outlined in the Operation and Maintenance Manual.

b. Regulatory Agency Requirements

Consult the agency holding jurisdiction on safe working rules for aerial lifts which apply to the job.

2. KB&M REQUIREMENTS

**Aerial Lifts: Both manlifts with telescoping booms and scissor lifts.**

a. Operators must make a thorough daily visual inspection, and repair any deficiency or replace any defective parts impairing safe operation of the equipment before continued use. Aerial lift inspection forms must be filled out daily.
b. The use of this equipment shall be on firm, level ground or surfaces, or as permitted by the manufacturer.
c. Manlifts must be positioned so that no part of the machine will come within the safe clearance zone of a powerline. Please refer to Section 2.4 (Overhead Powerline).
d. Aerial lifts are not to be used as a crane. They are for lifting personnel only and should not be used to lift or suspend loads.
e. When positioned for work, it is recommended that the area around the equipment be barricaded to prevent being struck by passing equipment or traffic. This will also alert other workers in the area of potential overhead work hazards.
f. All aerial lifts shall be equipped with a deadman switch which will prevent accidental movement of the machine. This deadman switch will be operational at all times.
g. Do not attempt any operation that will cause the workbasket to contact an object and induce an upward or downward force on the basket.
h. Do not position the basket on a building ledge, roof or any other object and boom down to increase stability of the basket.
i. Do not place anything in the basket to gain additional height. Do not stand or sit on the guardrails or mid rails.
j. Do not overload the work platform, and always work within the rated capacity.

**Manlifts with Telescoping Booms**

a. Approved full body harnesses and 4’ shock absorbing lanyards or retractable lanyard with a SofStop must be worn by all personnel in manlifts with telescoping booms. Each platform has anchorage points for fall protection (on rented equipment assure adequate anchorage points are provided). Consult the Operators Manual for details.
b. Avoid swinging over other personnel.
c. Whenever traveling on a grade, the boom shall be fully retracted and lowered. A change in grade with the boom extended could cause tipping. It is recommended that the route of travel be evaluated before operating equipment to inspect for hazards.
d. Do not allow the platform to strike the ground or surface while traveling as this can induce severe loading into the platform leveling system.
e. Do not lower the basket onto the ground or place against any other object, and attempt to free a struck machine by telescoping the boom.
Scissor Lifts

The platform guardrails will provide fall protection without tying off as long as the following conditions are met.

a. The machine is used on a level, solid surface.
b. The guardrails are properly installed and in good condition with an entry gate or chain that is closed when in use.
c. The floor is clear of debris.
d. Never sit, stand or climb on the platform guardrails.
e. Never climb down from the platform when it is raised.
f. Verify the tires are in good condition and the wheels are properly tightened.
g. Verify the machine's batteries and any counterweights are installed correctly.
h. Never mount attachments to the platform guardrails.
i. When moving the machine, the user should visually verify that other people are clear and that holes or objects that would affect the stability of the lift are avoided.
j. Do not drive the lift with the platform raised unless for minor slow adjustments.

D. DOUBLE TIE-BACK CHOKER POLICY

Double tie-back chokers are used to secure load lines when crane hooks are tied back to the crane. The tie-back is constructed of two cables of differing sizes and lengths. The main cable is the shorter and smaller cable. This cable secures the block directly and should have a breaking strength of 5:1 against the rated working capacity. The second cable is larger and longer. This cable should be wrapped around the smaller cable no more than five times. The two cables are to be swaged together into a common die.

Each fabricated double tie-back choker should be ordered and delivered with the following requirements:

- Each tie-back should be constructed of 6x19 IWRC EIPS domestic wire rope.
- Each tie-back should be proof tested to 2.5 times the rated working capacity of the smaller cable.
- Each cable should be tagged with the manufacturers identification, the tie-back sizes, the date of proof test, and the rated capacity. The tags should be made of metal.

![Diagram of Double Tie-Back Cable](image-url)

Wrap sling wire around the smaller tie cable no more than 5 times before the second aluminum duplex sleeve is pressed on, this will support the slack in the sling.

NOTE: DO NOT TWIST SLING WIRE AROUND TIE CABLE.

L = The length of the smaller (tie) cable.
The double tie-back choker should be placed into use after inspection. Each time the choker is used, it shall be inspected. If either of the cables is damaged it shall be removed from service. A monthly inspection program should be instituted to insure that damaged cables are not in service.

Below is a chart for specifying double tie-back cable sizes for various cranes. Contact the District Equipment Manager for applications not designated on the chart.

Wrap sling wire around the smaller tie cable no more than 5 times before the second aluminum duplex sleeve is pressed on, this will support the slack in the sling.

NOTE: DO NOT TWIST SLING WIRE AROUND TIE CABLE.

<table>
<thead>
<tr>
<th>Crane Size</th>
<th>Sling Diameter</th>
<th>Sling Length</th>
<th>Tie-back Cable Diameter</th>
<th>Tie-back Cable Length</th>
<th>Aluminum Sleeve Diameter</th>
<th>Swedging Die Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-50 Ton</td>
<td>½&quot;</td>
<td>10'</td>
<td>¼&quot;</td>
<td>8' 1&quot;</td>
<td>3/8&quot;</td>
<td>3/8&quot; O.C.</td>
</tr>
<tr>
<td>51-100 Ton</td>
<td>¾&quot;</td>
<td>12'</td>
<td>3/8&quot;</td>
<td>9' 0&quot;</td>
<td>5/8&quot;</td>
<td>5/8&quot; O.C.</td>
</tr>
<tr>
<td>101-150 Ton</td>
<td>1&quot;</td>
<td>14'</td>
<td>½&quot;</td>
<td>10' 2&quot;</td>
<td>7/8&quot;</td>
<td>7/8&quot; O.C.</td>
</tr>
<tr>
<td>151-200 Ton</td>
<td>1-⅜&quot;</td>
<td>16'</td>
<td>5/8&quot;</td>
<td>12' 0&quot;</td>
<td>1&quot;</td>
<td>1&quot; O.C.</td>
</tr>
<tr>
<td>201-250 Ton</td>
<td>1-⅝&quot;</td>
<td>18'</td>
<td>¾&quot;</td>
<td>11' 0&quot;</td>
<td>1-¼&quot;</td>
<td>1-¼&quot; O.C.</td>
</tr>
<tr>
<td>251-300 Ton</td>
<td>1-⅞&quot;</td>
<td>20'</td>
<td>7/8&quot;</td>
<td>16'</td>
<td>1-¼&quot;</td>
<td>1-¼&quot; O.C.</td>
</tr>
</tbody>
</table>

Listed below is pricing and ordering information:

West Coast Wire Rope & Rigging, Inc.  
2900 NW 29th Avenue  
Portland, OR 97210  
Contact – Michael Ramsey  
(800) 275-0482 / (503) 228-9353  
FAX (503) 228-2435

Crane Size:  
0 – 50 Ton     $ 48.34  
51 – 100 Ton   $115.94  
101 – 150 Ton  174.58  
151 – 200 Ton  301.00  
201 – 250 Ton  515.03  
251 – 300 Ton  768.40

FOB – Portland, Oregon (freight allowance credit of $50.00 will be issued on each shipment per 1,000 lbs.). Payment Terms – 1% 10, Net 30 Days. Prices good through December 31, 2012.

All double tie-back chokers must be ordered through authorized rigging manufacturers. Please contact the District Equipment Manager for company approved list.
SECTION 2.9 EQUIPMENT LOCKOUT/TAGOUT

All equipment shall be shut down and immobilized prior to performing maintenance or repairs. “DO NOT START” tags and locks must be placed at the control box or main switch by the employee who will perform the maintenance or repair, in accordance with the following:

A. Electrical

1. All electrical equipment involving the use of disconnect switches as a source of power for their operation will be turned off, locked out in the “OFF” position, and tagged.

2. After the equipment has been locked out and tagged, the employee will attempt to start the equipment to insure that the proper switch has been locked out and the equipment will not start.

3. If more than one employee is working on the equipment, multiple locks must be utilized. Individual locks for each employee are required.

B. Pneumatic and Hydraulic

1. All equipment operated pneumatically or hydraulically will be rendered inoperable by turning off the air to that piece of equipment and locking and tagging the valve.

2. After the equipment has been locked out and tagged, the employee will attempt to start the equipment to make sure that the proper switch and valve were locked out and the equipment will not operate. Also test to make sure the equipment will not operate from residual pneumatic or hydraulic pressure.

3. If more than one employee is working on the equipment multiple locks must be utilized. Individual locks for each employee are required.

C. Mobile or Vehicular Equipment

1. Where a keyed switch controls the ignition, the key shall be placed in the “OFF” position, removed, and the switch tagged.

2. Vehicles not equipped with a keyed ignition switch shall be tagged with a “DO NOT START” tag at the starter button or switch and the battery shall be disconnected.

D. Additional Requirements

1. No employee shall remove a lock, lockout device, or “DO NOT START” tag other than his or her own.

   a. In the event an employee leaves the equipment and forgets to remove the lock and tag, the employee is required to return to the equipment and remove the lock and tag.

   b. Violations of this policy will not be tolerated and are cause for immediate termination.

2. Each employee shall have his or her own lock with one key. This step cannot be performed by anyone but the person who will be performing maintenance on the equipment. After locking out, employees should be asked to place the key in their pocket.
3. If more than one person is working on a piece of equipment, a multiple lock out device should be used. Each employee must be provided and use his or her own lock.

E. The project superintendent must approve any deviations from these procedures in writing.
SECTION 2.10  GROUND FAULT CIRCUIT INTERRUPTER PROGRAM

This program covers all cords and tools that are not part of the permanent wiring of a building or structure.

All cords and tools must be visually inspected for damage before use.

All electrical sources shall be equipped with GFCI receptacles or GFCI pigtail adapters.

All electrical feeds, generators, spider boxes, high voltage cords feeding spider boxes, pigtails, high cycle cords and vibrators, and receptacles, shall be tested and marked with the appropriate colored tape (see below).  **This does not apply to 110V cords, tools, splitters or adapters.**

<table>
<thead>
<tr>
<th>Color</th>
<th>Season</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>Winter</td>
<td>January, February, March</td>
</tr>
<tr>
<td>Green</td>
<td>Spring</td>
<td>April, May, June</td>
</tr>
<tr>
<td>Red</td>
<td>Summer</td>
<td>July, August, September</td>
</tr>
<tr>
<td>Orange</td>
<td>Fall</td>
<td>October, November, December</td>
</tr>
</tbody>
</table>

Any generator or light plant used for temporary power above 5kW must be grounded.

Any project that has a temporary power system and does not comply with this program must submit an assured grounding program to the District Safety Manager for approval.
SECTION 2.11  EXCAVATION AND TRENCHING SAFETY RULES

Any job with excavation or trenching work must comply with the requirements of the Trenching and Excavation Safe Work Procedures. All excavations must be performed under the direct supervision of a competent person.

A copy of the applicable regulations must be onsite prior to beginning work.
SECTION 2.12 UNDERGROUND UTILITIES

The following procedures are contained in the companies “Check Before You Dig!” booklet (Form 517).

Copies of the booklet are available upon request from the Omaha Safety Department. A videotape entitled “Check Before You Dig!” is available from the Home Office video library.

EXCAVATION / UTILITY PERMIT

A dig permit / excavation permit is required for all pipe and grading operations and any operation requiring equipment and/or shovels.

A Hazard Analysis will be written for any operation requiring a dig permit. Foreman will be involved in preparing the Hazard Analysis and will review it with the crew before commencing any work. Additionally, each crewmember shall sign off that he/she understands the work operation and the hazard analysis plan.

A dig permit / excavation permit defines the work zone for the operation to be performed. The area where the excavation operation will take place should be delineated or marked with white paint so that when the Dig Safe locators know where the work is taking place. Once all Dig Safe and Potholing have been completed, the engineer, foreman, superintendent, operators, and any laborers involved will sign it.

Once the Excavation Permit is properly filled out, the following documents need to be attached to it before distribution to the foreman, operator, and crew:

1 ➔ A copy of the Hazard Analysis.

2 ➔ The first page in the Topography & Utility Plan. (Contact numbers for utility companies in the area.)

3 ➔ A copy of the Topography & Utility Plan sheets for the work zone that the Excavation Permit covers. Any utility relocations that have been completed before the start of the operation will be clearly noted on these drawings.

4 ➔ A copy of the Drainage Plan sheets for the work zone that the Excavation Permit covers. Notes and highlights will be made on these drawings to indicate which drainage items (i.e. catch basins, pipe runs, etc.) have been installed.

5 ➔ Any other pertinent information.

DIG SAFE

Dig Safe must be called before start of excavation.

This procedure requires anyone engaging in activities, which displaces earth, rock, or other material on or below the ground to notify Dig Safe at least two working days, but not more than seven days, prior to excavation. This means all contractors, subcontractors, and lower tiered subcontractors. Each separate company must notify Dig Safe of their excavation plans and have their own Dig Safe ticket.
NOTE: Many state laws further require companies to pre-mark the area of the proposed excavation with white paint, stakes, or flags prior to notifying Dig Safe.

THE COLOR OF SAFETY

Colors and symbols have been adopted by all utilities. The following are color codes for marking underground utilities:

1) BLUE → Water
2) ORANGE → Telephone, Railroad, Cable TV
3) GREEN → Sewer, Storm Drain
4) RED → Street Lighting, Electric, Traffic Signals (traffic signals may be orange)
5) YELLOW → Gas
6) PINK → Survey
7) WHITE → Proposed Excavation

NOTE: In some cases, the underground utilities belong to the owner of the property rather than the utility. For example, the utility may own the pipe/conductor up to a meter at the edge of a property. The pipe/conductor from the meter on into the property (i.e. a house or commercial building) belongs to the property owner. Member utilities will not mark the utilities beyond the right of way.

Traffic signal wires for intersections are typically not covered by Dig Safe. In addition, newly constructed work is not covered by Dig Safe (i.e. drainage, etc.). The plans will be referred to for locations of this work. In addition, the engineer, foreman, or superintendent responsible for this work will be contacted to verify what has been constructed.

OTHER LAWS AND REGULATIONS

FEDERAL LAWS – 49USC 60123 (D) Penalty for not using a one call notification system or not heeding location information or markings – “A person shall be fined under title 18, imprisoned for not more than five (5) years, or both, if the person knowingly and willfully –

(1) engages in an excavation activity –

   (a) without first using an available one-call notification system to establish the location of underground facilities in the excavation; or

   (b) without paying attention to appropriate location information or markings the operator of a pipeline establishes; and

(2) subsequently damages –

   (a) a pipeline facility that results in death, serious bodily harm, or actual damage to property of more than $50,000;
(b) a pipeline facility that does not report the damage promptly to the operator facility and to other appropriate authorities; or

(c) a hazardous liquid pipeline facility that results in the release of more than 50 barrels of product.”

OSHA REGULATIONS CFR 29 PART 1926 SUBPART P

(1) The estimate location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work shall be determined prior to opening an excavation.

(2) Utility companies shall be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the underground installations prior to the start of actual excavation. When utility companies or owners cannot respond to a request to locate underground installations within 24 hours (unless a longer period is required by state or local law), or cannot establish exact location of these installations, the employer may proceed, provided the employer does so with caution, and provided detection equipment or other acceptable means (pothole) to locate utility installation are used.

(3) When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means. This policy states that hand digging is required when within 2 feet of utilities.

(4) While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees and the security of the utility.

FIELD VISIT AND VERIFICATION

After Dig Safe has been activated and the 48-hour period has elapsed, a field verification visit is needed. The visit is used to verify that Dig Safe has come out to the work area and marked all utilities. The Foreman and utility engineer or superintendent will perform the field visit.

The Dig Safe markings will be compared to the utility drawings. If one or more Dig Safe members have not marked any or all of the utilities in the area, then call Dig Safe and give a SECOND NOTICE. Dig Safe will immediately send the locators out to mark the utilities.

During the field visit, the area will be inspected for any unknown utilities (i.e., landscape irrigation lines). If any unknown utilities are found, they will also be potholed and located.

Any utility relocations that have taken place and any drainage pipe that has been installed needs to be noted.

POTHOLING (What you don’t see can KILL you!)

Before excavating, potholing for the utilities will take place. Potholing is verifying the location and depth of the utility lines. Potholing will be done using hand labor, a VAC truck (if available), or a small hoe. Equipment can be used in conjunction with hand labor to accomplish the Potholing of the utility.

NOTE: Utilities located by Dig Safe have a two-foot safe zone. In other words, the utility should be within the markings plus or minus two feet.
A minimum clearance of 24 inches will be maintained between a marked and unexposed underground facility and the cutting edge or point of any power operated excavating or earth moving equipment. If excavation is required within 24 inches horizontally of any marking, the excavation will be performed with extreme care utilizing hand tools or vacuum excavation techniques (the utility engineer will be contacted to set up a utility owner representative to be on site when working within 24 inches of a known utility) only. Utility owners will not guarantee the depth of a utility. Therefore, projects will utilize the same excavation techniques vertically as we do horizontally, unless a utility owner informs us that we can use a different technique.

![Diagram of Hand Dig Area and Utility](image)

### Potholing Procedure:

**NOTE:** POTHOLE TO FIND THE UTILITY. If the utility was not found in the first pothole, **DO NOT** assume that this utility is not there. The utility must be positively located prior to the start of excavation operations.

1) The soil must be excavated in 6" lifts (approximately) by hand to verify that no utilities are present. Then the equipment can be used to excavate the material in that lift. If utilities are located, then the utilities must be exposed by hand. The proper tools that can be used for handwork are shovels and pry bars (or other tools of this nature). At no time should a pickaxe or other similar tools be used.

2) Mark all utilities with stakes and ribbon. Offset the marking where necessary. Make sure all personnel are aware of the location of the utilities in the area.

3) If any damage occurs to a line, contact the utility company, the utility engineer, or superintendent immediately.

4) The following is the required spacing of potholes for locating utilities:

   a) **DO NOT ASSUME THAT THE UTILITY WILL CONTINUE ON THE SAME LINE AND GRADE.**

   b) Gas and Electric.

      1) Uncover the entire line and for the entire length that is within your work area.

      2) For the locations that the gas and electric lines are within 25 feet of your work area, you need to pothole every 10 feet to verify that the line has not changed directions.

      3) Locations outside the 25-foot work zone will be potholed at least once to verify the accuracy of Dig Safe and utility plans.

   c) Cable TV

      1) Lines should be potholed every ten feet within your work area.
d) All other utilities:

1) pothole every 25 feet for lines less than 8” in diameter.

2) pothole every 50 feet for lines 8” through 24” in diameter.

3) potholes every 100 feet for lines greater than 24” in diameter.

e) At least **two (2)** potholes for each utility within the work zone must be obtained regardless of how small your work zone is.

f) Utilities in roadway:

1) Utilities that are located within the roadway will be potholed.

2) Street plates will be used to cover a pothole after shift when there is live traffic on the roadway. If plates will remain in place overnight, ensure that it is secured to prevent displacement. All plates shall be coated with an anti-skid material if in a public roadway or sidewalk.

3) If the roadway is not scheduled to be excavated in the current operation, then an asphalt patch will be placed over the pothole. This will be done after, and only after, all pothole information has been recorded and the pothole has been offset using stakes and ribbon. The offset is required so that the utility can be found quickly when roadway construction begins.

**NOTE:** Any deviation or change to the above potholing procedure must be approved in writing by the job sponsor and district safety manager.

Once all potholing has been completed, then excavation operations may start. However, the foreman and crew must always keep an eye out for unknown utilities.

Potholing will be shown on the two-week schedule. All future excavation operations should be planned far enough in advance to allow the potholing to be scheduled this way.

If during the course of excavation a utility has been exposed, it is our responsibility to inspect and support these facilities prior to backfilling. If damage of any kind is discovered, or any suspicion of damage exists, call the utility engineer so documentation can take place. The utility engineer will in turn notify the utility owner.

**OPERATOR AWARENESS**

Training will be performed with all superintendents, engineers, foreman, and operators. All personnel must be “Dig Safe” trained before working on an excavation operation. This training is also required in order to fill out and sign the Excavation / Utility Permit.

Violations of the potholing requirements will not be tolerated. Each incident will be treated on an individual basis with the involvement of project management. The disciplinary steps to be taken in any instance will be determined by the job manager in accordance with District policy.
REPORTING REQUIREMENTS

If a utility suffers damage, or is struck, there are several reporting steps that need to take place:

1) First and foremost, contact the appropriate utility owner to inform them of the damage so they can inspect and repair, if necessary. In addition, the utility engineer, safety manager (if applicable), and the project manager will be contacted. The utility engineer will record all the information needed to fill out a report (who, where, when, why, and how). Pictures should be taken of the incident. A list of emergency contact numbers should be readily available by each job phone and as part of all work packages.

2) The utility engineer will complete a **Utility Damage Report**.

3) Once the Utility Damage Report has been completed, it will be faxed to the insurance company and the district office. **NOTE: The report will be done and faxed to both parties within 24 hours of the utility hit.**

4) The report should be filed on the project in a separate book designated for the utility hit reports.
Excavation Utility Permit

I. GENERAL INFORMATION

<table>
<thead>
<tr>
<th>Permission No.</th>
<th>Location of excavation (attach plans):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Drawing Numbers of Plans Attached (highlight utilities):</td>
</tr>
<tr>
<td></td>
<td>Purpose of excavation:</td>
</tr>
<tr>
<td></td>
<td>Start Date: Expected Completion Date: Depth: Width: Length:</td>
</tr>
</tbody>
</table>

II. DIG SAFE NOTIFICATION

<table>
<thead>
<tr>
<th>Dig Safe Ticket No.</th>
<th>Date Requested: Requested By:</th>
</tr>
</thead>
</table>

III. PRE-WORK CHECKLIST (Must be completed by “Dig Safe Operator” certified personnel only.)

<table>
<thead>
<tr>
<th>Initialed By</th>
<th>Comments (If “N”, explanation required, use reverse side.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Construction Mtg Held w/ Utility Owners</td>
<td>Y / N / NA</td>
</tr>
<tr>
<td>Plans Verified Against Dig Safe Markings</td>
<td>Y / N</td>
</tr>
<tr>
<td>Locations of Recent Relocations Known (check Utility Relocation Design Drawings)</td>
<td>Y / N / NA</td>
</tr>
<tr>
<td>Dig Safe Markings Offset</td>
<td>Y / N / NA</td>
</tr>
<tr>
<td>Visual Check for Unmarked Utilities (i.e., manholes, telephone pedestals, etc.)</td>
<td>Y / N</td>
</tr>
<tr>
<td>All Utilities Potholed within Max. Limits (every 25’ for lines less than 8”, every 50’ for lines 8”-24”, every 100’ for lines greater than 24”)</td>
<td>Y / N / NA</td>
</tr>
<tr>
<td>Equipment Analyzed for Size, Wt., Speed (for minimizing vibration or shock to utility)</td>
<td>Y / N / NA</td>
</tr>
<tr>
<td>Adequate Lighting (Night Work Only)</td>
<td>Y / N / NA</td>
</tr>
<tr>
<td>Hazard Analysis Prepared &amp; Reviewed / Date</td>
<td>Y / N / NA</td>
</tr>
</tbody>
</table>

IV. SIGNATURES (All Signatures required. All must be “Dig Safe Operator” certified.)

<table>
<thead>
<tr>
<th>Location of Dig Safe Markings Known</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineer</td>
<td>Y / N</td>
</tr>
<tr>
<td>Operator</td>
<td>Y / N</td>
</tr>
<tr>
<td>Foreman</td>
<td>Y / N</td>
</tr>
<tr>
<td>Superintendent</td>
<td>Y / N</td>
</tr>
<tr>
<td>Approv. Superintendent</td>
<td>Y / N</td>
</tr>
</tbody>
</table>

V. AS-BUILTS

<table>
<thead>
<tr>
<th>As-Built Completed:</th>
<th>Y / N / NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Required if relocating utility or existing location varies from plans.)</td>
<td></td>
</tr>
</tbody>
</table>
SECTION 2.13    FALSEWORK AND SHORING SAFETY

Policy

For purposes of this policy, falsework and shoring safety shall include bridge falsework, bridge overhang systems, cross beam support, temporary haul bridges, and trestles.

A. Design: All falsework shall be designed, reviewed, approved, and inspected as outlined in this policy.

B. Falsework Stripping: A falsework stripping plan shall be reviewed and approved by the job sponsor during the falsework design stage.

C. Falsework Lowering Winches: When using a lowering winch system to strip falsework, the winches shall have regular inspections to ensure they are in safe working order.

1. The superintendent or general foreman in charge of falsework stripping and the on-site master mechanic will personally conduct a visual inspection before each lowering.

2. Each winch assembly, including its associated rigging and electrical gear, will undergo a thorough annual inspection per the attached Falsework Winch Annual Inspection. Personnel qualified to perform or supervise this inspection will include the master mechanic, equipment superintendent or a dealer representative selected by the district equipment manager.

   The district equipment manager will notify the job superintendent when these annual inspections are due.

3. Lowering over the side of a bridge overhang is not permitted unless approved in writing by the District Manager.

DESIGN OF FALSEWORK

Policy Statement

This policy outlines the implementation of the falsework design process. It also provides guidelines to select responsible and qualified individuals to execute the policy. In general, it covers the actual design, the subsequent design review, and the inspection of the as-built falsework.

Falsework construction is high-risk work with significant potential liability associated with failure and collapse. To manage and mitigate the inherent risks in design and construction of such temporary work, Kiewit Bridge & Marine has developed this policy to assign specific responsibilities to company personnel, consultants, and subcontractors.

“Falsework” is defined as any temporary construction work on which main or permanent work is wholly or partially supported until such permanent work becomes self-supporting. Such terms as shoring, posting, bracing, beam support, soffit support, overhang bracket support systems, temporary towers, manufactured soffit support systems, etc. may be considered “falsework.” For the purposes of this policy, haul bridges and work trestles are also considered “falsework.”
Qualifications

1. Designer

District or Kiewit Engineering Co. (KECo) personnel who undertake falsework designs must be
Registered Professional Engineers with experience in similar type and magnitude of falsework
designs. The designer must be qualified to design all components of the system unless part of the
system incorporates patented shoring towers such as the PAFCO or EFCO 100 kip/leg towers.
The designer must take adequate time to conduct the necessary site investigation, perform
detailed calculations, prepare drawings, write procedures, and inspect the installations.

Consultants must also be Registered Professional Engineers, have extensive falsework design
experience, and carry adequate Errors and Omissions (E&O) insurance, as determined by Kiewit’s
Risk Management Department.

Projects will conduct a thorough study or interview process when selecting a consulting firm to
perform falsework designs. The individual responsible for the design must also be available for
required site inspections.

2. Reviewer

The individual responsible for the complete and independent review must have the same
qualifications as the “designer.” A written report of the reviewer’s findings must be provided to the
designer and made available to the inspection team. Normally the review will provide an “accept”,
“reject”, or “approval as noted” disposition. If additional details or calculations are required from
the designer, approval should be delayed until such details or calculations are submitted,
reviewed, and approved by the reviewer.

3. Inspector

◆ Job Superintendent.
◆ Designer – Individual responsible for the design.
◆ Reviewer – Individual responsible for the design review.
◆ Designated District Employee – Individual with considerable experience in similar falsework
design and erection as determined by the District Manager.
◆ Designer Authorized Representative – Individual with considerable experience in similar
falsework design and erection with written authorization by the Designer and District Manager.

Approval Process

The selection of those responsible for falsework design, design review, and inspections must be made
in conformance with this policy and approved by the District Manager.

The Designer Authorized Representative will be allowed to perform falsework and shoring inspections
as an alternate to the designer. This will only occur once the designer has provided his/her written
case-specific authorization for this person to act on the designer’s behalf. Copies of the designer’s
written authorization and the District Manager’s written approval will be kept on file in the project
engineer’s office on site.
Inspections

The bridge superintendent shall notify the designer in a timely fashion of any changes to the original design, necessitated by field conditions, and obtain approval from the designer prior to loading that portion of the work. The bridge superintendent and project engineer must maintain a “single source” file of all “as built” conditions with the related approved supplemental drawings and calculations.

The Job Superintendent or a designated district employee, and the designer or reviewer, will make regular inspections of the falsework during the erection. After erection is complete and prior to placing concrete or loading the falsework to its design capacity, the job superintendent or the designated district employee, and the designer or reviewer must take the final design drawings to the falsework location to conduct adequate visual and dimensional checks of all components such as blocking, wedging, bracing, alignment, beam sizes, spacing, etc. It will be necessary to closely inspect the work, to verify that all components are properly placed, caps and stringers are vertical, bearing loads are directly over posts or legs, and within the design tolerances. This two-person team will provide written documentation in the form of a checklist or equivalent to indicate their approval of the falsework prior to loading.

Requirements

Falsework requirements will fall into one of the following three categories. Each category has different designer, reviewer, and inspection requirements, depending on the complexity and associated level of risk.

A. Falsework for Conventional Low Risk Structures

| Attributes | This category comprises structures up to 40 feet at the highest point, with short spans, normal loads (minimal horizontal loads), and relatively flat slopes (8% maximum longitudinal grade and cross slopes less than 6%). The existing ground must be flat, stable, and without potential for lateral movement. The underside of the falsework must be flat and would not include traffic openings. |
| Designer | District registered professional engineer OR KECo OR consultant. |
| Reviewer | A different district registered professional engineer OR KECo OR consultant. |
| Inspection | Job Superintendent OR designated district employee AND designer or reviewer. |
B. Falsework for Structures with Moderate Risk

| Attributes | This category comprises structures up to 60 feet at the highest point with slopes not exceeding 8% longitudinally or 6% transversely. The structures may be over moderately unstable ground or over water and have moderate horizontal loads. Included are structures, regardless of size, which will cause damage to other structures or property if a collapse occurs. This falsework does not include traffic openings. |
| Designer | A highly qualified district registered professional engineer OR KECo OR consultant. |
| Reviewer | KECo OR different consultant. |
| Inspection | Job Superintendent OR designated district employee AND designer or reviewer. |

C. Falsework for Structures with High Risk

| Attributes | This category comprises major structures where the configuration will produce significant horizontal loads during concrete placement (e.g., arch, inclined underside, and large parabolic sections) and structures over 60 feet high. Included are structures, regardless of size, where a failure would be a hazard to the general public (e.g. traffic openings) or structures that would create a significant liability if a collapse occurred. |
| Designer | Consultant OR KECo. |
| Reviewer | KECo OR different consultant. |
| Inspection | Job Superintendent OR designated district employee AND designer. |

D. Subcontracted Work

If shoring is to be subcontracted then the subcontractor’s qualifications and experience must be thoroughly reviewed by qualified district personnel. The District Manager must approve the selected subcontractor. Additionally:

- The subcontractor must permit the district to review and approve the subcontractor’s falsework designer for compliance with the above design, review, and inspection criteria.
- The subcontractor’s designers must provide evidence of acceptable E&O Insurance.
- Inspection of falsework installed by a subcontractor will first be conducted by subcontractor personnel followed by qualified district and job personnel in conformance with the above requirements.
Policy Administration

The administration and implementation of this policy is the responsibility of the District Manager. Specifically, the following points are to be covered:

A. Develop a plan to comply with the requirements of this policy (see attached example 2-13-9 on page 12). The plan must be reviewed and approved by the District Manager.

B. This plan will include a check off system requiring signature approval for each element.

C. Assign a job sponsor to monitor the selection of each responsible participant and to track the status of each element (i.e. design, design review, and inspection).

D. The project engineer shall maintain inspection documentation including any checklists or the equivalent on site. A copy shall be sent to the assigned sponsor.
DESIGN OF COFFERDAMS AND SUPPORT OF EXCAVATION SYSTEMS

Policy Statement

This policy outlines the implementation of the cofferdam and support of excavation (SOE) design process. It also provides guidelines to select responsible and qualified individuals to execute the policy. In general, it covers the actual design, the subsequent design review, and the inspection of the as-built system.

Cofferdam and SOE construction is high-risk work with significant potential liability associated with failure and collapse. To manage and mitigate the inherent risks in design and construction of such temporary work, Kiewit Bridge & Marine has developed this policy to assign specific responsibilities to company personnel, consultants, and subcontractors.

“Cofferdams” are defined as a support system built to restrain water or soil from entering a work area. “Support of Excavation” defines any support system whose function is to temporarily restrain soil or rock.

Qualifications

1. Designer

   District or Kiewit Engineering Co. (KECo) personnel who undertake cofferdam/SOE designs must be Registered Professional Engineers with experience in similar type and magnitude of cofferdam/SOE designs. The designer must be qualified to design all components of the system unless part of the system incorporates patented systems such as anchor rods, speed shores, trench boxes, etc. The designer must take adequate time to conduct the necessary site investigation, perform detailed calculations, prepare drawings, write procedures, and inspect the installations.

   Consultants must also be Registered Professional Engineers, have extensive cofferdam/SOE design experience, and carry adequate Error and Omissions (E&O) insurance, as determined by Kiewit’s Risk Management Department.

   Projects will perform a thorough study or interview process when selecting a consulting firm to perform cofferdam/SOE designs. The individual responsible for the design must also be available for required site inspections.

2. Reviewer

   The individual responsible for the complete and independent review must have the same qualifications as the “designer”. A written report of the reviewer’s findings must be provided to the designer and made available to the inspection team. Normally the review will provide an “accept”, “reject”, or “approval as noted” disposition. If additional details or calculations are required from the designer, approval should be delayed until such details or calculations are submitted, reviewed, and approved by the reviewer.

3. Inspector

   ◆ Job Superintendent.
   ◆ Designer – Individual responsible for the design.
Reviewer – Individual responsible for the design review.

Designated District Employee – Individual with considerable experience in similar cofferdam/SOE design and installation as determined by the District Manager.

Designer Authorized Representative – Individual with considerable experience in similar falsework design and erection with written authorization by the Designer and District Manager.

**Approval Process**

The selection of those responsible for cofferdam/SOE design, design review, and inspections must be made in conformance with this policy and approved by the District Manager.

The Designer Authorized Representative will be allowed to perform Support of Excavation inspections as an alternate to the designer. This will only occur once the designer has provided his/her written case-specific authorization for this person to act on the designer’s behalf. Copies of the designer’s written authorization and the District Manager’s written approval will be kept on file in the project engineer’s office on site.

**Inspections**

The bridge superintendent shall notify the designer in a timely fashion of any changes to the original design, necessitated by field conditions, and obtain approval from the designer prior to loading that portion of the work. The bridge superintendent and project engineer must maintain a “single source” file of all “as built” conditions with the related approved supplemental drawings and calculations.

The Job Superintendent or a designated district employee, and the designer or reviewer will perform the inspection of the cofferdam/SOE before excavation. At a minimum, the inspection team must take the final design drawings to the work location to conduct adequate visual checks of all components, including the sheeting, soldier piles, lagging, walers, struts, bracing, welding, bolting, etc.

Records of sheet pile driving, soldier pile installation, anchor rod installation, etc. should be kept on file and used to develop an as-built of the cofferdam/SOE. This should be submitted to the designer for review prior to excavation. SOE should be monitored for movement. Groundwater should be monitored and logged. If there are changes to the load conditions identified in the design, it needs to be reported immediately to the designer. This two-person team will provide written documentation in the form of a checklist or equivalent to indicate their approval of the cofferdam/SOE prior to loading.

**Requirements**

Cofferdam/SOE system requirements will normally fall into one of the following three categories. Each category has different design, review, and inspection requirements depending on the complexity and associated level of risk.
A. **Cofferdams/SOE for Low Risk Structures**

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Cofferdams with or without tremie seal and a dewatered depth less than 15 ft. SOE systems with a supported excavation depth less than 10 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designer</td>
<td>District registered professional engineer OR KECo OR consultant.</td>
</tr>
<tr>
<td>Reviewer</td>
<td>A different district registered professional engineer OR KECo OR consultant.</td>
</tr>
<tr>
<td>Inspection</td>
<td>Job Superintendent OR designated district employee AND designer or reviewer.</td>
</tr>
</tbody>
</table>

B. **Cofferdams/SOE for Structures with Moderate Risk**

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Cofferdams with tremie seal and a dewatered depth between 15 ft. and 30 ft. SOE systems with a supported excavation depth between 10 ft. and 20 ft. These structures would normally require multiple levels of bracing and/or tiebacks installed in a staged construction procedure. Design loads would be highly dependent on the type of soil, surcharge loadings, water table, and construction sequence selected.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designer</td>
<td>A highly qualified district registered professional engineer OR KECo OR consultant.</td>
</tr>
<tr>
<td>Reviewer</td>
<td>KECo OR different consultant.</td>
</tr>
<tr>
<td>Inspection</td>
<td>Job Superintendent OR designated district employee AND designer or reviewer.</td>
</tr>
</tbody>
</table>

C. **Cofferdams/SOE for Structures with High Risk**

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Cofferdams with tremie seal and a dewatered depth greater than 30 ft., plus all cofferdams without tremie seal with dewatered depth greater than 15 ft., plus cofferdams founded on and excavated to rock. SOE systems with a supported excavation depth greater than 20 ft. These structures usually require multiple levels of bracing and/or tiebacks as well as considerable judgment in determining soil/rock load parameters and in selecting an appropriate construction sequence. Included in this category are cofferdams/SOE systems, regardless of size, where a failure would be a hazard to the general public or would create a significant potential liability.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designer</td>
<td>Consultant OR KECo.</td>
</tr>
<tr>
<td>Reviewer</td>
<td>KECo OR different consultant.</td>
</tr>
<tr>
<td>Inspection</td>
<td>Job Superintendent OR designated district employee AND designer.</td>
</tr>
</tbody>
</table>
Other construction facilities including temporary trestles, bridges, gantries, docks, bulkheads, picking beams, etc. must receive the same careful engineering analysis that cofferdam/SOE systems receive. The guidelines provided above apply in appropriate measure to the design of all temporary structures on our work.

D. Subcontracted Work

If cofferdam/SOE work is to be subcontracted then the subcontractor’s qualifications and experience must be thoroughly reviewed by qualified district personnel. The District Manager must approve the selected subcontractor. Additionally:

- The subcontractor must permit the district to review and approve the subcontractor’s selection of a cofferdam/SOE designer for compliance with the above design, review, and inspection criteria.
- The subcontractor’s designers must provide evidence of acceptable E&O Insurance.
- Inspection of cofferdam/SOE work installed by a subcontractor will first be conducted by subcontractor personnel, followed by qualified district and job personnel, in conformance with the above requirements.

Policy Administration

The administration and implementation of this policy is the responsibility of the District Manager. Specifically, the following points are to be covered:

A. Develop a plan to comply with the requirements of this policy (see attached example 2-13-9 on page 12). The plan must be reviewed and approved by the District Manager.

B. This plan will include a check off system requiring signature approval for each element.

C. Assign a job sponsor to monitor the selection of each responsible participant and to track the status of each element (i.e. design, design review, and inspection).

D. The project engineer shall maintain inspection documentation including any checklists or the equivalent on site. A copy shall be sent to the assigned sponsor.
WALL CHART, CHECK LISTS, QUALITY CONTROL PLAN

A. Each project shall post a wall chart in the job office as shown on the attached Figure 1 (sample copy of a falsework inspection sheet for bridge overhangs) for classification and tracking the status of design, review, and inspection of all falsework shoring, temporary bridge, and trestles on the project.

Note: The District Manager shall approve the plan for designer and inspection.

B. Each project shall have a Quality Control Plan for each type of falsework shoring, temporary bridge, or trestle installation.

1. This Quality Control Plan shall include a definition of the allowable construction tolerances to comply with the design.

2. The Quality Control Plan shall also include a detailed inspection checklist tailored for the type of structure to be checked. The checklist shall have specific individual items to be checked, signed, and dated in the Job Superintendent inspection to ensure compliance with the design. Refer to the Engineering Manual (Volume 4) for a general checklist that can be used as a starting point to develop the checklist for the particular structure.

C. Engineering Firm Matrix

<table>
<thead>
<tr>
<th>Designer</th>
<th>Falsework</th>
<th>Shoring (Support of Exc, Emb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kiewit Engineering</td>
<td>All Types</td>
<td>All Types</td>
</tr>
<tr>
<td>Smith, Monroe, &amp; Gray</td>
<td>All Types</td>
<td>All Types</td>
</tr>
<tr>
<td>Geotechnical Design Services</td>
<td>No</td>
<td>All Types</td>
</tr>
<tr>
<td>Zbinden Carter Engineering</td>
<td>Low Risk</td>
<td>Low Risk</td>
</tr>
</tbody>
</table>

D. Engineering Firms Contact Information

<table>
<thead>
<tr>
<th>Engineering Firm</th>
<th>Contact Person</th>
<th>Phone No.</th>
<th>Fax No.</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kiewit Engineering</td>
<td>Dave Sinsheimer</td>
<td>(402) 271-2820</td>
<td>(402) 271-2874</td>
<td>1000 Kiewit Plaza Omaha, NE 68131</td>
</tr>
<tr>
<td>Smith, Monroe, &amp; Gray</td>
<td>Don Hamann</td>
<td>(503) 643-8595</td>
<td>(503) 643-8610</td>
<td>10700 SW Beaverton Hwy, Suite 210 Beaverton, OR 97005</td>
</tr>
<tr>
<td>Geotechnical Design Services</td>
<td>Bret Debernardi</td>
<td>(801) 562-1047</td>
<td>(801) 562-8702</td>
<td>9265B S Redwood Road West Jordan, UT 84088</td>
</tr>
<tr>
<td>Zbinden Carter Engineering</td>
<td>Russ Carter</td>
<td>(541) 884-7421</td>
<td>(541) 883-8804</td>
<td>104 N Eleventh Street Klamath Falls, OR 97601</td>
</tr>
</tbody>
</table>
## FALSEWORK WINCH ANNUAL INSPECTION

### Generator Set

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Initial</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Check Engine High Idle</td>
<td>(</td>
</tr>
<tr>
<td>2</td>
<td>Check Engine Low Idle</td>
<td>(</td>
</tr>
<tr>
<td>3</td>
<td>Drain Sediment From Fuel Tank</td>
<td>(</td>
</tr>
<tr>
<td>4</td>
<td>Check Coolant Hoses For Condition &amp; Clamp Tightness</td>
<td>(</td>
</tr>
<tr>
<td>5</td>
<td>Check For Oil, Intake And Exhaust Leaks</td>
<td>(</td>
</tr>
<tr>
<td>6</td>
<td>Pressure Test Cooling System</td>
<td>(</td>
</tr>
<tr>
<td>7</td>
<td>Check Glow Plugs For Amperage Draw</td>
<td>(</td>
</tr>
<tr>
<td>8</td>
<td>Check Condition Of All Instruments And Gauges</td>
<td>(</td>
</tr>
<tr>
<td>9</td>
<td>Check For Fully Charged Fire Extinguisher</td>
<td>(</td>
</tr>
<tr>
<td>10</td>
<td>Check Radiator Core For Damage</td>
<td>(</td>
</tr>
<tr>
<td>11</td>
<td>Check All Belts For Wear And Tightness</td>
<td>(</td>
</tr>
<tr>
<td>12</td>
<td>Check Battery Holdowns And Clean Terminals</td>
<td>(</td>
</tr>
<tr>
<td>13</td>
<td>Check And Clean All Motor Starters</td>
<td>(</td>
</tr>
<tr>
<td>14</td>
<td>Check All Electrical Equipment For Proper Enclosures</td>
<td>(</td>
</tr>
</tbody>
</table>

### Winches

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Initial</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Check Frame For Cracks Or Other Structural Damage</td>
<td>(</td>
</tr>
<tr>
<td>2</td>
<td>Check Tip Sheave For Condition And Lubrication</td>
<td>(</td>
</tr>
<tr>
<td>3</td>
<td>Torque Winch To Frame Mounting Bolts</td>
<td>(</td>
</tr>
<tr>
<td>4</td>
<td>Check Condition And Spooling Of Hoist Wire</td>
<td>(</td>
</tr>
<tr>
<td>5</td>
<td>Check Drum Dog For Proper Operation</td>
<td>(</td>
</tr>
<tr>
<td>6</td>
<td>Disassemble, Inspect And Repair Motor Brake Assembly</td>
<td>(</td>
</tr>
<tr>
<td>7</td>
<td>Disassemble, Inspect And Repair Work Brake Assembly</td>
<td>(</td>
</tr>
<tr>
<td>8</td>
<td>Sample And Change Oil In The Worm Gearbox</td>
<td>(</td>
</tr>
<tr>
<td>9</td>
<td>Check All Electrical Cord And Connectors For Damage</td>
<td>(</td>
</tr>
<tr>
<td>10</td>
<td>Bar Check Drum Bearings</td>
<td>(</td>
</tr>
<tr>
<td>11</td>
<td>Check Entire Winch For Proper Lubrication</td>
<td>(</td>
</tr>
<tr>
<td>12</td>
<td>Check All Blocks, Shackles, Etc. Used With Winches</td>
<td>(</td>
</tr>
<tr>
<td>13</td>
<td>Load Test 110% Of Capacity (28,600# Single Line Pull)</td>
<td>(</td>
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</tbody>
</table>
# Checklist for Design, Design Review, and Inspection of Falsework and Shoring

**Job Name**

**Project Manager/ Superintendent**

<table>
<thead>
<tr>
<th>Location/Description</th>
<th>Classification (Conventional, Moderate Risk, High Risk)</th>
<th>Designer (Name/Firm)</th>
<th>Designer Review (Name/Firm)</th>
<th>Inspections (Initial and Date When Complete)</th>
<th>DM or ADM Approval</th>
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</thead>
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<tr>
<td></td>
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<td></td>
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<td>Job Supt Name</td>
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<td>INT</td>
</tr>
</tbody>
</table>

Project Manager/Superintendent is to submit the plan for Design, Design Review and the Designated Inspectors to the District Manager for approval.
FALSEWORK CERTIFICATION FOR OVERHANG

**Project:**

**Bridge:**

**Inspection Date:**

**Superintendent:**

**Risk Classification:**

**Engineer:**

<table>
<thead>
<tr>
<th>Engineer</th>
<th>Superintendent</th>
<th>Designer/Reviewer</th>
<th>Job Superintendent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**GENERAL**

1. Is there a design and double check for the falsework?
2. Are the plans with you when doing the inspection?

*Comments:*

---

**BRACKETS**

1. Are the brackets as shown in the plans?
2. Are the brackets at the correct spacing?
3. Are the carrier support jacks extended beyond 12”?
4. If they are beyond 12” is additional support needed for the support brackets?
5. Are the brackets plumb to the girder?
6. Are the thru bolts for the girder the correct diameter with the correct washer?
7. Are the brackets in good condition? Cracks, etc.?
8. Are the washers as shown in the plans?

*Comments:*

---

**FORMWORK**

1. Are carriers the correct size and length?
2. Are carriers in good condition?
3. Are joists the correct material (LVL required)?
4. Are joists the correct spacing?
5. Are joists in good condition?
6. Is the EOD per the design drawings?
7. Is the EOD in good condition?
8. Is the plywood the correct size?
9. Is the plywood in the direction required?
10. Is guardrail system adequately installed?
11. Are stiffeners or temporary bracing required?
12. Are hold-downs required for carriers?

*Comments:*

---

*Figure 1*
SECTION 2.14 RESPIRATORY PROTECTION

OSHA issued a revised Final Rule, which governs the General and Construction Industries use of respiratory protection equipment for employees.

The use of respiratory protection equipment poses physiological and psychological hazards to employees; therefore our first obligation as an employer is to avoid situations where employees are required to use this equipment. This is accomplished through the use of engineering controls such as ventilation at the source by either capturing or exhausting, enclosure of the hazardous area, performing hazardous work on off-shifts, and/or substitution of less hazardous materials. Experience has shown that most atmospheric hazards associated with construction work can be controlled in this manner. If, following our best effort to control these hazards through hazard controls, the atmospheric hazards remain at levels at or above established limits, then a Respiratory Protection Program will be required.

The provisions of this policy shall apply to all employees, its subsidiaries, joint ventures and subcontractors of any tier.

Jobs with actual or potential respiratory hazards must notify the District Safety Manager, who is the program administrator for all respiratory protection in the district. Each job will be required to develop a site-specific respiratory protection program when employees are exposed to atmospheric hazards.
SECTION 2.15    SWING RADIUS GUARDING POLICY

Per OSHA requirements, we will install swing radius guards on all of our crawler and lattice boom truck cranes or when the rotating superstructure is less than seven (7) feet off the ground or working surface. This rule also applies to excavators, except that OSHA will permit the installation of signs on the three sides of counterweights warning of the swing hazard, in lieu of barricading the area. When possible, swing alarms and lights should be installed on excavators.

Swing radius guards shall barricade access into the pinch points of the crane and rotating superstructure as shown in the following drawings. In addition to these guards, it is necessary to barricade the areas where the counterweight swings within 2 feet of any object or structure. This rule also applies to rubber tired and crawler type excavators.

Removal of swing radius guards will be permitted for equipment in transit only and must be reinstalled when in its working location. (Spotters will be stationed to prevent personnel from entering pinch point locations.)

Since these radius guards are frequently damaged or destroyed, it is recommended they be constructed of 2” PVC pipe. PVC will bend and does not create an impalement hazard. PVC is also easily replaced when broken.

The guards create an exclusion zone. This exclusion zone applies to all persons. The only time a person may enter the exclusion zone is when the crane is not moving, swinging or hoisting and the crane operator has acknowledged your presence and has granted access. The operator must stop all swinging and exit the cab.

If anyone is within the exclusion zone when the operator is required to activate the crane, that person shall be warned and move into the clear (outside of the zone) prior to any movement (including hoisting). The operator is responsible to visually verify this either by walking around the machine or physically observing the person in the clear.

The operator, foreman and superintendent retain responsibility for assuring compliance with this policy. Additionally, all persons working with or around the crane will be informed of this policy prior to assignment.
SECTION 2.16 SYNTHETIC SLINGS

Synthetic slings cannot be used for general hoisting purposes. Synthetic slings can only be used if wire rope slings are not suitable for a unique hoisting condition and Job Superintendent approval is obtained as outlined below. If synthetic slings are used for hoisting, then the following procedure shall be followed.

1. A detailed **HAZARD ANALYSIS** will be prepared specifically for the lift utilizing synthetic slings.

2. A detailed **RIGGING PLAN** will be prepared specifically for the lift utilizing synthetic slings. The rigging plan will include the following information regarding the synthetic slings:

   (a) Why wire rope is not being used?
   (b) A rigging sketch showing the position of slings for the lift.
   (c) The material of the slings, *(polyester, nylon or aramid/K-Spec™)*.
   (d) The type of sling, *(flat web, round or Twin-Path®)*.
   (e) The type of hitch, *(vertical, chocker or basket)*.
   (f) The product code or stock number for the sling.
   (g) The rated capacity of the sling, *(hitch specific)*.
   (h) The load/force the sling will see during the lift.
   (i) The percent capacity *(the load/force in the sling ÷ rated capacity of the sling × 100)*.
   (j) Is padding and/or softeners needed, *(show on sketch)*.

   **Note:** Refer to the District’s “Guideline for Synthetic Slings”
   Appendix B: Example of a Rigging Plan for Synthetic Slings

3. A **DESIGNATED RIGGER** will be specified by name for the lift utilizing synthetic slings. The Designated Rigger is a person, selected by the Superintendent responsible for the lift, who:

   (a) Is knowledgeable of the operation for which the lift is being performed.
   (b) Is experienced in the basic fundamentals of rigging and crane lifts related to the heavy construction industry.
   (c) Has the authority and the capability to make prudent and safe decisions during the lift.
   (d) Has been provided a copy of the District’s “Guideline for Synthetic Slings” and reviewed it in its entirety with the Superintendent responsible for the lift.
   (e) Has signed the “Training Record”.
   (f) Will be present at all times while synthetic slings are being used.

   **Note:** Refer to the District’s “Guideline for Synthetic Slings”
   Appendix A: Training Record for Designated Rigger

4. **JOB SUPERINTENDENT APPROVAL** will be obtained prior to a lift utilizing synthetic slings. The Job Superintendent will be provided a copy of the following for his/her review and approval:

   (a) The Hazard Analysis.
   (b) The Rigging Plan.
   (c) The Designated Riggers name and the signed copy of the “Training Record”.

**Note:** Refer to the District’s “Guideline for Synthetic Slings”
Appendix A: Training Record for Designated Rigger
**WARNING:** The proper selection and use of *padding* and/or *softeners* when using synthetic slings to make a lift is crucial. Several incidents within Kiewit have occurred where loads were dropped due to inadequate protection of synthetic slings.

(a) All sharp edges or abrasive areas of the load that come in contact with synthetic slings are to be *padded* to prevent damage to the sling when making a lift.

(b) All sharp bends of the load that come in contact with synthetic slings are to be *softened* to increase the radius or decrease the angle (soften the angle) on the corner of the load so that the sling capacity is not significantly reduced when making a lift.

*Note:* Refer to the District’s “Guideline for Synthetic Slings” Section 7: Padding and Softeners

**Administration**

The Job Superintendent is responsible for the administration of this policy.
SECTION 2.17 FREE CUTTING AND SKIL SAW GUIDELINES

Because of the potential dangers posed by the use of skil saws, the following policies have been adopted and must be followed.

- **No Free Cutting.** Free cutting is supporting the material to be cut with your body (foot, leg, and hand). The member to be cut must be supported by a table or other wood, and fastened in place. An employee may hold the wood in place upon its support, but the piece being cut must be supported on a stable surface.

- **Protect Your Eyes.** ANSI approved eye protection are minimum wear when using a skil saw. In some situations, depending on weather conditions, etc., goggles or a face shield may also be necessary. Eyewash stations should be available in the work area in the event dust enters the eye.

- **Protect Your Hearing.** If a lot of cutting is planned, the use of hearing protection is strongly recommended for the employee performing the cutting and others in the area also. For intermittent use, hearing protection is usually not needed, but will be provided if an employee requests it.

- **Inspect Your Equipment.** Skil saws must be in proper working condition at all times. To ensure this, inspect the saw daily before it is connected to a power source. A typical inspection includes assured grounding, a free and complete movement of the blade guard, easy adjustment of the sole (guide) plate; installation of proper saw blades and making sure they are sharp.

- **Jamming the Guard** is not permitted.

- **Cord Length:** can present a hazard from the plug becoming caught as the cut is made. Employees must be instructed to be aware of this and to ensure that the saw will pass freely through the full length of the cut without catching the plug or having too little cord available. Repairing a cord by removing damaged portions will shorten the cord and can create this hazard. It is often best to either replace the entire cord or shorten it such that the plug connection does not create such a hazard.

- **Suitable Cutting Surface.** This means all cutting must be done on a suitable cutting surface (preferably wood), which will not inhibit blade movement.
  - Set blade depth before connecting to power.
  - **Plunge Cuts** must be made with both hands on the saw and not “walking” into the cut. The front sole of the saw must be in contact with the wood as the rotating blade is lowered into the cut. The work piece shall be secured from movement.
  - **Cutting Small Pieces:** Proper attention must be given to the cutting of small pieces so the proper cutting tool will be used. Sometimes, Skil saws are too big for cutting small pieces of material and other cutting devices must be used. The work piece shall be secured from movement.
SECTION 2.18  FLASHBACK ARRESTORS FOR TORCHES

Flashback arrestors prevent a flame from entering the oxygen/acetylene hoses and/or the regulators, depending on their installation location.

Flashback arrestors will be installed on both the torch and regulator ends of each oxygen/acetylene setup. The Victor torch company supplies a torch with the flashback arrestor in the handle; called the Journeyman Kit. In this case, a flashback arrestor will only be required on the regulator end. If a job is not using this particular torch, a flashback arrestor will be required on both ends of the setup.
SECTION 2.19  
HORN SIGNALING AND BACK-UP ALARMS FOR VEHICLES

All company owned vehicles (passenger cars, light and heavy duty trucks, etc.) shall be equipped with an audible reversing alarm. This alarm must engage when the vehicle’s transmission is switched into reverse, and be distinguishable over the surrounding noise level. There may not be any switch installed to prevent and/or interrupt the sound emitted by the backup alarm.

In addition to the back up alarm, a series of three short blasts of the vehicle’s horn shall be sounded before reversing. This is only applicable when on company owned property or a jobsite location. This is not required when operating a company vehicle anywhere else (such as at home, etc.).

Dashboard reminder stickers are available in the district office.
SECTION 2.20 CHAIN/LOAD BINDERS

Standard lever style load binders may not be used on any jobsite. Only “pushover” style load binders may be used. These binders employ the use of a swinging lever, which requires much less effort to release, and does not have a swing range as large as conventional binders. Please see an example following this section.

Cheater pipes may not be used to either tighten or release a load binder. A 30” long combination winch/binder bar is the only bar that can be used to increase leverage.

All deliveries received by the job will require the person delivering the load to unlash the binders – unless the load is being delivered by another Kiewit jobsite.

All employees who may use chain/load binders must be trained in the following:

- Selection of the right binder for the application intended.
- Listing of hazards inherent with their use.
- Proper positioning for leverage
- The use of winch/binder bars for increased leverage.
- How to secure the lever to the chain when locked in a tensioned position.
Acco Load Binders

The Pushover® BX-600 Load Binder

When using this load binder or any other load binder, you must keep your body clear of the handle of the load binder. The design of this load binder does not prevent recoil during the locking process.

1. The handle freely moves to the start of the release point
2. At this stage, the center body starts to rotate independently of the handle. The handle virtually remains in the same position as the chain tension is release.

Acco High Strength Transportation Load Binders are of the highest quality drop forged construction and meets DOT requirements for truck tiedown use. Each 600-, 400 and 320 series binder is proof tested at the factory.

These tough binders swivel 360 degrees at both ends and the handles of the lever binders toggle away from the load allowing easier release under all load conditions. For all heavy duty interstate transport users. Meets all D.O.T. requirements.
SECTION 2.21 SCAFFOLD PLANKS

In applications where OSHA approved scaffolding planks are required, only Microllam LVL OSHA stamped lumber scaffolding plank will be purchased for our jobsites.

When properly cared for and inspected, Microllam planks can be reused for several years.
SECTION 2.22 TRIGGER LOCKS

All electrical power tools purchased or used on our projects will have manufacturer’s trigger locking mechanisms disabled and/or removed. Any holes created by the removal of such devices will be filled in with silicone or other similar material to prevent moisture from entering the tool.

Fuel powered tools such as chainsaws and chop saws may require the use of a throttle-locking device for starting purposes. These may remain in place provided a written procedure incorporating the manufacturer’s starting instructions and Hazard Analysis are prepared and reviewed with the operator.
SECTION 2.23  SKIP BOXES

It is the policy of our company to utilize only those lifting devices that have been reviewed and approved for such purposes.

The company has a standard drawing and engineered data for skip boxes.

A placard describing the loading criteria for common materials will be displayed on both sides of the box. The data referenced on that placard represents the maximum capacity for such materials and shall not be exceeded. (Note that these ratings are based on the structural integrity of the box and lifting ears. Excessive damage will be cause for removal from service.)

Any alternate container planned for use as a material lifting device requires a detailed engineering analysis by a qualified person and the Project Manager’s approval.
# Materials List & Item Description

Quantities per Modified Skip Box

## Hardware
*(All steel should be A-36 or better)*

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<thead>
<tr>
<th>Name</th>
<th>Quantity</th>
<th>Description/Dimensions</th>
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<tbody>
<tr>
<td>Carriage Bolt</td>
<td>60</td>
<td>3/8” Dia x 4 1/2” Steel Carriage Bolts</td>
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<tr>
<td>Hex Nut</td>
<td>60</td>
<td>3/8” NC Hex Nut</td>
</tr>
<tr>
<td>Lock Washer</td>
<td>60</td>
<td>3/8” Lock Washer (for under Hex Nut)</td>
</tr>
<tr>
<td>Fit Washer</td>
<td>60</td>
<td>1/2” Fit Washer (for under Carriage Bolt Head)</td>
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## Steel Components

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<tbody>
<tr>
<td>L3x2x1/4”</td>
<td>2</td>
<td>L3x2x1/4” of length 108”</td>
</tr>
<tr>
<td>L6x2x1/4”</td>
<td>4</td>
<td>L6x2x1/4” of length 35”</td>
</tr>
<tr>
<td>Hook</td>
<td>4</td>
<td>1/2” Diameter RB x 3”Length</td>
</tr>
<tr>
<td>Hook Bar Support Plate</td>
<td>4</td>
<td>1.0” Diameter steel bar of length 6”</td>
</tr>
<tr>
<td>Weld Plate Channel Plate</td>
<td>4</td>
<td>4”x5”x1/2” steel plate (for placement under Hook Bar)</td>
</tr>
<tr>
<td>W-Girder</td>
<td>2</td>
<td>W8x13 x 4’ 6” (cut to shape)</td>
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## Wood Members

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<td>2</td>
<td>4x10 DF No. 2 or better of length 10ft</td>
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<tr>
<td>4x12 DF</td>
<td>7</td>
<td>4x12 DF No. 2 or better of length 10ft</td>
</tr>
<tr>
<td>End Gate</td>
<td>2</td>
<td>4’ 6”x1’ 11 1/4”x3/4” plywood</td>
</tr>
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</table>
SECTION 2.24       STRETCH AND FLEX

Stretch and Flex exercise for all crews should be done daily at the start of each shift. The stretching may be combined with the “Two-Minute Minder.”

Each job is responsible for ensuring the exercises are done. Documentation of the exercise must occur. The specifics of documentation are to be determined by job management. A recommended method of documentation can be signing the back of the timecard each day.

A Stretch and Flex video is available from Omaha and should be shown to all new hires on the first day. New employees will be instructed that this is a daily stretching and exercising program. They must also be cautioned not to overexert themselves and to do the exercises at their own pace.

Stretch and Flex posters are available at the District office for display on the jobsite. Call the District Safety Manager for supplies.
SECTION 2.25  RED BOLT POLICY

On many of our projects we have concrete vertical formwork for walls, columns, caps and other structures. Most of the time, we will pre-strip the forms by removing most of the ties, bolts and braces. This allows us to break the bond on the ties/bolts and expedite the final stripping. In many cases, the vertical forms may be left on the wall for a period of time either for concrete strength or curing requirements.

It is the policy of Kiewit Bridge & Marine to ensure all vertical formwork is stripped in a controlled manner. Each project must develop a specific “Red Bolt Policy” that identifies a safe procedure for stripping forms. Each and every form must utilize red bolt tags on pre-determined bolts, braces or engineered systems that can only be removed when a crane is properly rigged to the form. In addition to the tags, a JHA must be completed and a “designated supervisor” assigned to authorize the removal of the bolts, braces or engineered systems.

The project “Red Bolt Policy” must be approved by the Job Superintendent.

Engineered systems to tie the wall back must use components that are rated. Using wire to tie the forms back is unacceptable.

Sample tag:

![Sample tag image]

DO NOT REMOVE

THIS BOLT MAY ONLY BE REMOVED AFTER AUTHORIZATION FROM THE DESIGNATED SUPERVISOR
SECTION 2.26 ENVIRONMENTAL COMPLIANCE POLICY

Kiewit Bridge & Marine will comply with the Corporate Environmental Policy. The key points of the policy are:

- Prevent discharging pollutants that impact stormwater;
- Prevent releases of hazardous and toxic pollutants to the air, soil, and/or water;
- Provide environmental compliance training and education for our employees;
- Seek to prevent pollution before it is produced, and reduce the amount of waste at our facilities; and
- Work continuously to improve the effectiveness of our environmental program.

The District Manager shall appoint a District Environmental Manager (DEVM). Each project site and each fixed facility shall have a Project Environmental Coordinator (PEC) to establish and coordinate the day-to-day activities of their respective environmental programs. The DEVM, as well as the PEC positions, will be company stockholders or report directly to a senior stockholder on the job.

The District Environmental Manager (DEVM) shall notify its District Attorney and the Corporate Environmental Department if any of the following occur:

- A receipt of any Notice of Violation, Administrative Consent Order, Notice of Discrepancy, Complaint, or similar action (including penalty) from an environmental agency or citizens’ group.
- A spill or release into the air, soil or waters of any material that might be a pollutant.
- Any inquiry from a government agency, citizens’ group, or other private party concerning a potential violation or our potential involvement in the contamination or cleanup of a contaminated site.
- Any environmental inspection or audit by the project owner or any environmental agency.
- A decision to purchase or lease any real property.
SECTION 2.27 DRUG AND ALCOHOL TESTING PROGRAM
KIEWIT BRIDGE & MARINE

Scope

This program, which is part of the COMPANY’s Substance Abuse Policy (Kiewit Corporate Policy Manual Section 3-23), applies to all applicants and employees. Applicants and employees must comply with the policy and this program as a condition of their employment. Testing will be conducted in accordance with this program and applicable law.

Work Rules

Whenever employees are working, operating COMPANY vehicles, machinery or equipment, present on COMPANY premises including but not limited to, all offices, jobsites, project right-of-ways or any other location performing services for the COMPANY, they are prohibited from:

- using, possessing, buying, selling, manufacturing, distributing, dispensing or transferring illegal drugs;
- being under the influence of illegal drugs, unauthorized prescription drugs, alcohol or inhalants;
- possessing or consuming alcohol;

Employees should report to work fit for duty and free of any adverse effects of illegal drugs, alcohol, or inhalants.

This policy does not prohibit employees from the lawful possession and use of prescribed medications. Employees have the responsibility to consult with their doctors or other licensed medical practitioners about the effect of prescribed medications on their ability to perform their specific job duties in a safe manner, and to promptly disclose any work restrictions to their supervisors or the District Human Resources Department. Employees should not, however, disclose underlying medical conditions, impairments or disabilities to their supervisors or the District Human Resources Department unless specifically directed to do so by their doctors or other licensed medical practitioners. The COMPANY reserves the right to have its physician or occupational clinic determine if a prescription drug produces hazardous effects or to restrict the quantity the employee is allowed to bring to the worksite. For the safety of all employees, the COMPANY may place a person(s) using such drugs in a less hazardous job assignment (if available) or place them on temporary medical leave until released as “fit for duty” by the prescribing physician.

Definitions

“Alcohol” means the intoxicating agent in beverage alcohol or any low molecular weight alcohols such as ethyl, methyl or isopropyl alcohol. The term includes beer, wine, spirits and medications such as cough syrup that contain alcohol.

“COMPANY premises” include, but is not limited to, all land, property, buildings, offices, facilities, grounds, parking lots, and places owned, leased, managed or used by the COMPANY.

“COMPANY vehicle” means all vehicles owned, leased or used by the COMPANY and all vehicles that are used by employees, regardless of who owns or leases them, while working for the COMPANY.

“Illegal drugs” mean all controlled substances, designer drugs, and other drugs not placed in any schedule by the federal government that are not being used or possessed under the supervision of a licensed health care professional. (Controlled substances are listed in Schedules I-V of 21 U.S.C. § 812 and 21 C.F.R. Part 1308.)
“Inhalants” mean gases and volatile compounds such as glue, nitrous oxide, gasoline or solvents that are inhaled intentionally to produce feelings of intoxication, euphoria or stupefaction.

“Medical Review Officer” or “MRO” is a licensed physician contracted by the COMPANY who has knowledge, training, and clinical experience regarding substance abuse disorders and who will, among other things, review applicants’ and employees’ positive drug test results and evaluate any medical explanations for such results.

“Refuse to cooperate” means to obstruct the collection or testing process, including not promptly proceeding to a collection site when told to do so, providing an adulterated or substituted specimen, failing to attempt to provide specimens, failing to sign testing and other required forms, and any other conduct that obstructs or interferes with testing.

“Test positive for alcohol” means to take an alcohol test that results in an alcohol concentration of .04 or more.

“Test positive for drugs” means to take a drug test that results in a concentration of marijuana, cocaine, opiates, amphetamines, and phencyclidine (PCP), or their metabolites, or any illegal drugs (as defined on previous page) that exceeds the cutoff levels that are set forth in 49 C.F.R. Part 40 and are subject to change by the federal government.

“Under the influence” means to test positive for drugs and/or alcohol or an employee’s actions, appearance, speech or bodily odors that reasonably cause the COMPANY to conclude that the employee is impaired because of illegal drug use or alcohol or inhalant misuse.

**Testing**

1. **Pre-employment:** All applicants must pass a drug test before they begin working for the COMPANY. The only exception to this policy is Union Craft Employees for which a “clean card” system is in place and recognized between the COMPANY and the Union.

2. **Reasonable Suspicion:** Employees are subject to drug and alcohol testing if the COMPANY, based on specific facts and reasonable inferences drawn from such facts, reasonably suspects them of using or being under the influence of alcohol or drugs while they are working, operating COMPANY vehicles, machinery or equipment, present on COMPANY premises, or present in any other location performing services for the COMPANY.

3. **Post incident:** Employees are subject to drug and alcohol testing when the COMPANY reasonably believes they may have caused or are involved in a work-related incident that results or could have resulted in an injury to a person who requires first aid, medical treatment, or property damage. Employees must notify their supervisors or the District Safety Manager as soon as safely possible after any incident, even if it does not result in serious damage to a COMPANY vehicle, machinery or equipment or an injury to a person.

4. **Random:** Each calendar year, COMPANY employees may be subject to random drug and alcohol testing. The tests will be unannounced, spread throughout the year, and the selection of employees will be made by a scientifically valid method.

5. **Return-to-duty and follow-up:** Employees who test positive for drugs and/or alcohol or who otherwise violate this policy, will be terminated. Depending on the circumstances, an employee’s return to work, reinstatement and/or continued employment may be possible after 90 days, and are subject to these conditions:

   a. Confirmation of negative results on a new pre-hire drug screen.
b. Employee must show proof of completion of an approved substance abuse program.

c. The employee will be subject to periodic, unannounced drug screens for a period of two years.

d. If a second test is positive, the employee will be discharged with no opportunity for rehire.

Transferred Employees: All supervisory employees currently employed by the COMPANY and previously tested may be tested again under the above conditions and/or as part of a district-wide drug screen. The Business Manager receiving the transferred employee will confirm that the employee was last screened in less than 90 days. If more than 90 days have passed since the last screening, the provisions of pre-employment screening shall apply.

Summary of Alcohol Collection and Testing Procedures

1. If an employee is subject to alcohol testing, the employee will be sent or escorted to a COMPANY designated facility where the employee will have to verify his/her identity (state issued driver's license or other state issued picture identification) and otherwise cooperate in the facility's normal breath specimen collection procedures.

2. Alcohol testing will be conducted, in private, by a trained breath alcohol testing technician (the “BAT”) who will use approved evidential breath testing devices (“EBTs”) and testing forms. Chain-of-custody procedures shall be maintained from collection to the time specimens may be discarded.

3. A screening test will be done first. If the employee’s screen test result is less than .02, the employee will have passed the alcohol test.

4. If the employee’s screen test result is .02 or greater, the employee will have to take a confirmation test after waiting 15-30 minutes. During that waiting period, the employee should not eat, drink, smoke, put anything in his/her mouth, or belch (so that the test will not measure mouth alcohol fumes).

5. Before and after the confirmation test, the BAT will run air blank tests to see if the EBT is working correctly.

6. For the confirmation test, the employee must exhale into a mouthpiece until the BAT directs the employee to stop. The BAT will then show the employee the printed and displayed results. The results of the confirmation test, not the screen test, are determinative. If the employee’s confirmation test result is less than .04, the employee will have passed the test. If the employee’s confirmation test result is .04 or more, the employee will have tested positive for alcohol.

7. The BAT will notify the COMPANY of the employee’s test results in a confidential manner.

Summary of Drug Collection and Testing Procedures

1. If an applicant or an employee is subject to drug testing, the individual will be tested using the Quick Screen protocol found in Appendix A or escorted to a COMPANY designated facility where the individual will have to verify his/her identity (with a state issued driver’s license or other state issued picture identification) and otherwise cooperate in the facility’s normal urine specimen collection procedures.

2. The individual’s urine specimen will be collected, in private, by a certified collector who will use approved collection containers and chain-of-custody and control forms. The individual should ensure that the entries on the form are accurate and that his/her specimen is identified with the
same number as appears on the custody and control form. Chain-of-custody procedures shall be maintained from collection to the time specimens may be discarded.

3. If an applicant or employee does not provide a specimen of at least forty-five (45) ml, the certified collector will discard the specimen (except where the specimen was out of the acceptable temperature range or showed evidence of tampering), direct the individual to drink up to forty (40) ounces of water over a period of up to three (3) hours, or until the individual provides an adequate specimen, whichever occurs first.

If the individual refuses to provide a new specimen, the certified collector will terminate collection and notify the COMPANY that the individual has refused to cooperate. If the individual does not provide an adequate specimen within three (3) hours of the first unsuccessful attempt, testing will stop and he/she will be directed to obtain an evaluation by the MRO or a physician who has expertise in the medical issues raised by the individual's failure to provide a sufficient specimen. The individual must obtain the evaluation within five (5) days. If the MRO determines that a medical condition has, or it is highly probable a legitimate medical condition could have, prevented the individual from providing a sufficient specimen, the test will be canceled, and no further action will be taken. If there is not an adequate basis to determine that a medical condition has, or it is highly probable that a medical condition could have prevented the individual from providing a sufficient specimen, the individual will be deemed to have refused to cooperate.

4. If the applicant or employee does provide an adequate specimen, it will be sealed and labeled with a unique specimen number in the individual's presence. The individual will then be told to initial the identification labels on the specimen containers. The individual and the certified collector will also fill out and sign portions of a custody and control form that identifies the individual and his/her specimen.

5. The specimen container will be sent to a certified laboratory for analysis. The lab will also conduct validity testing to determine if the primary specimen is adulterated, diluted, or substituted. If the specimen is suitable for testing, the lab will run a screen test on it. If the screen test is negative, the lab will report that the individual has passed the drug test. If the screen test is positive, the lab will analyze the individual's specimen using gas chromatography/mass spectrometry. The lab will send the test results to the MRO.

6. The MRO is a trained licensed physician who, among other things, is responsible for ensuring the accuracy and integrity of the drug testing process. If the individual has a confirmed positive, adulterated, substituted or invalid drug test result, the MRO will contact the individual by telephone at the numbers listed on the custody and control form. The individual should promptly cooperate with the MRO. If the individual can provide a legitimate medical explanation for a positive, adulterated, or substituted test result, the MRO will report a negative test result to the COMPANY. If the individual does not provide a legitimate medical explanation for an adulterated or substituted test result, the MRO will report to the COMPANY that the individual has refused to cooperate. Invalid test results will be canceled and, depending on the circumstances, may subject an individual to additional testing.

7. If an applicant or employee wants the split specimen to be tested by another certified lab, the individual should tell the MRO within seventy-two (72) hours of notice of his/her test results. This split specimen test will be at his/her cost. If the second lab fails to confirm a positive test or that a specimen was adulterated or substituted, the MRO will cancel the test results. If the split specimen is not available for testing, the individual will be required to provide another specimen under direct observation. If the second lab confirms a positive test or that the specimen was adulterated or substituted, the individual will have tested positive for drugs.
8. After completing the medical review process, the MRO will disclose the individual's test results to the COMPANY in a confidential manner. The individual can request a copy of the results from the COMPANY. Information the MRO obtains through the drug testing procedures, that is unrelated to the individual’s use of illegal drugs or alcohol, will be kept confidential and will not be disclosed to the COMPANY.

**Inspections**

The COMPANY reserves the right to inspect all parts and aspects of its premises for illegal drugs, alcohol or other contraband. All employees and visitors may be asked to cooperate in inspections of their persons, work areas, and property (such as purses, tool boxes, lunch boxes, water coolers, thermos bottles, flasks, briefcases, desks, cabinets, lockers or cars) that might conceal illegal drugs, alcohol or other contraband.

**Crimes Involving Drugs**

Employees who are convicted of, plead guilty to (including a plea of nolo contendere or no contest), or are sentenced for a crime involving illegal drugs in the workplace must report the conviction, plea or sentence to their supervisor(s) or the District Human Resources Department within five (5) days after such conviction, plea or sentence. If an employee who is convicted of, pleads guilty to or is sentenced for a crime involving illegal drugs performs work directly relating to the COMPANY’s contracts or grants with a state or the federal government, the COMPANY will report such conviction, plea or sentence to the appropriate agency within ten (10) days after it receives notice.

The COMPANY may take disciplinary and/or other appropriate action in accordance with the requirements of applicable law when an employee is involved in any crime that damages the COMPANY’s operations or reputation.

**Consequences**

1. Applicants who refuse to cooperate in a drug test or who test positive for drugs will not be hired by the COMPANY.

2. Employees who refuse to cooperate in a drug and/or alcohol test will be terminated.

3. Employees who test positive for drugs and/or alcohol or who otherwise violate this policy will be terminated. Depending on the circumstances, an employee’s return to work, reinstatement, and/or continued employment may be possible after 90 days. In addition, employees must successfully participate in and/or complete any and all evaluations, counselings, treatments, and rehabilitation programs, passing of return-to-duty and follow-up tests, and/or other appropriate conditions as determined by the COMPANY.

Disciplinary action may be modified from that described above at the discretion of the District Manager, only under special circumstances.

**Confidentiality**

Information and records relating to test results and other medical information shall be kept confidential and maintained in files separate from employees’ personnel files. Such information and records may be disclosed to applicants and employees, or any other third party, designated in writing by an applicant or an employee, the MRO, a substance abuse professional, physician, or other health care provider, responsible for determining an employee’s ability to safely perform his/her job and/or the employee’s successful participation in and/or completion of any and all evaluations, counselings, treatments, and rehabilitation programs, to and among the COMPANY’s supervisors on a need-to-know basis, where
relevant to the COMPANY’s defense in a grievance, arbitration, administrative proceeding, lawsuit or other legal proceeding, or as required or otherwise permitted by law.

Subcontractors and Vendors

Subcontractors, sub-tiered contractors, vendors and their employees shall cooperate with this policy in achieving a drug-free and alcohol-free workplace.

Additional Drug and Alcohol Testing Requirements for CDL

1. The COMPANY owns and operates a number of vehicles that are classified as commercial motor vehicles according to definitions set forth by the U.S. Department of Transportation and State Department of Motor Vehicle Agencies. As a motor carrier we are required by California law (VC34501.12), to participate in an inspection program conducted by the California Highway Patrol. This law is known as the Biennial Inspection of terminals or BIT Program. The COMPANY enrolls COMPANY drivers into any applicable program and establishes files where vehicle maintenance records and driver records will be maintained and made available for inspection.

2. The operation of vehicles on public roadways is a safety sensitive function. All drivers of commercial motor vehicles are required to comply with our Drug and Alcohol Policy and may be subject to the more restrictive DOT Drug and Alcohol Policy.

3. All drivers of placarded vehicles and vehicles with GVWR of 26,001 pounds or more will be required to submit to random testing.

4. The District Equipment Manager can be reached at 360-694-1201 to answer drivers’ questions about the COMPANY DOT Drug and Alcohol Policy.

Amendments to Policy

Amendments to this policy may be issued to comply with client requirements, state or local laws, or federal contract requirements. Any amendments to this policy must be requested in writing to the District Manager.
Appendix A

**PROTOCOL FOR "QUICK SCREEN"**

The following procedures will be followed when a Company authorized collector is administering a “Quick Screen” drug test. Procedures may vary slightly from “Quick Screen” manufacturer’s requirements.

**STEP 1:** Provide applicant/employee with Drug and Alcohol Policy and obtain signed Consent form.

**STEP 2:** Remove “Quick Screen” test kit from sealed packet, in the presence of the applicant/employee being tested.

**STEP 3:** Validate the presence of temperature strip to the front of cup.

**STEP 4:** Have applicant/employee provide urine specimen. Be sure to indicate how much volume of urine is required. Further instruct applicant/employee to secure lid and return with specimen.

**STEP 5:** Use latex gloves when handling urine specimen.

**STEP 6:** Set cup down and allow five (5) minutes for test windows to validate test.

**STEP 7:** If sample specimen confirms a negative test, have applicant/employee return to the restroom for disposal. The urine can be flushed down the toilet and the test kit container can be disposed of with restroom garbage.

**STEP 8:** (Option 1) If the urine specimen test is non-negative, have supervision escort the applicant/employee to the clinic/lab for testing. All applicants and current COMPANY employees must present a driver’s license or other state issued picture identification card to the clinic/lab at the time of testing.

(Option 2) If test is non-negative, complete the chain-of-custody information and seal in a shipping bag for the lab to pick up. Explain to the applicant/employee that he/she is not allowed to begin work until after the confirmation tests are complete (usually one to two days). If non-negative test turns out to be false, he/she will be hired if the position is still available. Applicant/employee will also be paid for any time missed waiting for test confirmation.

**STEP 9:** Continue with the new hire orientation process only after confirmation of a negative test.
Appendix B

SIGNs AND SYMPTOMS OF A DRUG OR ALCOHOL PROBLEM

Drugs and alcohol can result in work-related problems such as absenteeism and tardiness, lower productivity, missed deadlines, poor work quality, and increased incidents and injuries. People misusing alcohol and using illegal drugs may experience a number of other behavioral problems. Examples include problems relating to or communicating with co-workers and customers, refusing to accept directives from supervisors, sudden changes in attitude, mood or work performance, and changes in personal appearance and hygiene. Drug use and alcohol misuse can also result in a number of health problems.

Evidence of use can include paraphernalia such as pipes, syringes, foil packets, pills, pill bottles, powders and empty alcohol containers. Physical signs and symptoms of use can include:

- marijuana and alcohol odors
- hangovers
- droopy eyelids, bloodshot eyes, dilated or pinpoint pupils
- nosebleeds, excessive sniffing, chronic sinus problems, nasal sores
- needle tracks or blood spots on clothing
- tremors, racing or irregular heartbeats
- slowed, slurred or incoherent speech
- coordination problems
- fatigue, lethargy and sleepiness
- depression or anxiety
- neurotic or psychotic behavior
- slow, delayed or erratic decision-making and reactions
- jitters, hand tremors or hyperexcitability
- loss of concentration or memory
### EMPLOYEE CONSENT/REFUSAL FORM

#### TO BE FILLED OUT BY SUPERVISOR OR BUSINESS REP:

<table>
<thead>
<tr>
<th>Employee Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervisor or Business Rep. Name:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date:</th>
<th>Location:</th>
</tr>
</thead>
</table>

| Other Supervisor(s) Involved: |

#### Type of Test: |

<table>
<thead>
<tr>
<th>Pre-employment</th>
<th>Reasonable Suspicion</th>
<th>Post Incident</th>
<th>Random</th>
<th>Return-to-duty</th>
<th>Follow-up</th>
</tr>
</thead>
</table>

#### Specimen(s) To Be Collected:

<table>
<thead>
<tr>
<th>Breath</th>
<th>Urine</th>
<th>Hair</th>
<th>Blood</th>
<th>Saliva</th>
</tr>
</thead>
</table>

#### TO BE READ AND FILLED OUT BY EMPLOYEE:

I understand that I have been selected for a drug and/or alcohol test under the COMPANY’s Drug and Alcohol Testing Program. I know that I may refuse to be tested if I wish, but that my refusal will result in my termination.

I also understand that if I cooperate in testing:

- I will have to provide specimen(s) at a collection site chosen by the COMPANY and cooperate in the site’s normal collection procedures.

- My specimen will be either tested on site using the Quick Test protocol or sent to a certified, accredited and/or licensed laboratory chosen by the COMPANY and tested for alcohol, marijuana, cocaine, opiates, amphetamines, and phencyclidine (and such other controlled substances as may be dictated by the circumstances in accordance with the requirements of applicable law).

- If there is evidence of drug use in my specimen, my specimen will be retested by a laboratory and if the laboratory determines my sample to be positive then a Medical Review Officer ("MRO") will make reasonable efforts to discuss my test results with me. If I explain or rebut the results to the satisfaction of the MRO, I will be treated as if I passed the drug test. If not, I will have failed the drug test. The MRO will disclose my test results to the COMPANY.

- If the measured alcohol concentration of my specimen is less than .02, I will have passed the alcohol test. If the measured alcohol concentration of my specimen is .02 or more, I will be required to submit to confirmation testing. If the confirmation test results in a measured alcohol concentration of .02 or more, I will have failed the alcohol test.
concentration of less than .04, I will have passed the test. If the confirmation test result is .04 or more, I will have failed the test. The technician will disclose my test results to the COMPANY; and

- I will be subject to appropriate disciplinary action, up to and including termination of employment and other appropriate conditions as determined by the COMPANY, if I refuse to cooperate in a drug and/or alcohol test, test positive for drugs and/or alcohol, or otherwise violate the policy.

After considering my options, I have freely, knowingly and voluntarily decided to:

___ REFUSE TO BE TESTED

___ CONSENT TO AND AUTHORIZE TESTING AND THE DISCLOSURE OF MY TEST RESULTS TO THE COMPANY AND RELEASE THE COMPANY, ITS MRO, COLLECTION SITE AND LABORATORY, AND THEIR AGENTS FROM ANY LIABILITY THEY MIGHT OTHERWISE HAVE FOR THE ACTIONS I AM AUTHORIZING.

Employee Signature

Date
Appendix D

AUTHORIZATION FOR RELEASE OF INFORMATION

This form must be filled out completely.

I, ________________, (Employee Name), authorize ________________, (Hospital/Clinic/Laboratory) to disclose its evaluation of me, to disclose and discuss my continuing ability (or inability) to perform my job safely, to report on my current drug/or alcohol use, and to disclose my participation in, successful completion of, or non-completion of treatment to the COMPANY for the purposes of determining my ability to perform my job safely and effectively, monitoring my progress in treatment, and determining whether I am in compliance with my obligations to the COMPANY.

This consent is valid until ________________, (Date). I understand that I may revoke this consent at any time except to the extent that action has been taken in reliance thereon. I also understand that I may, upon request, receive a copy of this Authorization.

By executing this form, I release and hold harmless the COMPANY, their directors, officers, and agents from any and all liability that may arise due to the disclosure of information and documentation as authorized herein.

<table>
<thead>
<tr>
<th>Employee Name (Please Print)</th>
<th>Business Dept. Rep. Name (Please Print)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employee Signature</th>
<th>Business Dept. Rep. Signature</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Date</th>
</tr>
</thead>
</table>
## REASONABLE SUSPICION CHECKLIST
### SUSPECTED DRUG AND ALCOHOL IMPAIRMENT OR POSSESSION

### Employee Name:          Date/Time:          

### Supervisor:            Project:            

### Employee’s Job Position/Assignment:

The purpose of this form is to help you decide if you have reasonable justification to suspect that an employee is using drugs or alcohol in violation of the COMPANY’s Substance Abuse Policy. This form must be filled out and signed within [twenty-four (24) hours] of the observed appearance, behavior, speech or body odors, or before test results are released, whichever is earlier.

Reasonable suspicion testing selections must be based on specific observations concerning the appearance, behavior, speech or body odors of an employee (including indications of the chronic or withdrawal effects of drugs). You should keep that guideline in mind as you determine whether or not reasonable suspicion exists.

While you do not have to check every box for an employee to be subject to testing, you should be cautious if the circumstances do not present multiple indications of prohibited drug and/or alcohol use.

### Other Management Witness to Incident:

### Non-Management Witnesses to Incident:

### Witness' Observation:

<table>
<thead>
<tr>
<th>Observation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Breath/clothes smell like alcohol</td>
<td></td>
</tr>
<tr>
<td>Breath/hair/hands/clothes smell like marijuana</td>
<td></td>
</tr>
<tr>
<td>Eyes bloodshot</td>
<td></td>
</tr>
<tr>
<td>Eyelids droopy or puffy</td>
<td></td>
</tr>
<tr>
<td>Eyes glassy</td>
<td></td>
</tr>
<tr>
<td>Eyes watery</td>
<td></td>
</tr>
<tr>
<td>Pupils dilated</td>
<td></td>
</tr>
<tr>
<td>Pinpoint pupils</td>
<td></td>
</tr>
<tr>
<td>Eyes do not track side to side movement smoothly</td>
<td></td>
</tr>
<tr>
<td>Face flushed</td>
<td></td>
</tr>
<tr>
<td>Face pale</td>
<td></td>
</tr>
<tr>
<td>Sleepy</td>
<td></td>
</tr>
<tr>
<td>Unusual sweating</td>
<td></td>
</tr>
<tr>
<td>Speech slurred</td>
<td></td>
</tr>
<tr>
<td>Speech incoherent</td>
<td></td>
</tr>
<tr>
<td>Speech rambling</td>
<td></td>
</tr>
</tbody>
</table>

- Will not stop talking
- Will not talk
- Voice unusually loud or soft
- Stumbles/staggers or falls when walking
- Sways/sags or leans on support when standing
- Movements jerky or uncoordinated
- Acts hyperactive
- Moves very slowly
- Sudden, marked mood swings
- Sudden, marked changes in activity level
- Unusually quarrelsome, irritable or hostile
- Erratic or violent actions
- Does not seem to care about anything
- Confused
- Unusually anxious
Appendix E (2 of 2)

Did management offer employee union representation?  Yes or No

<table>
<thead>
<tr>
<th>EMPLOYEE ACCEPTED</th>
<th>EMPLOYEE DECLINED</th>
</tr>
</thead>
<tbody>
<tr>
<td>(initial)</td>
<td>(initial)</td>
</tr>
</tbody>
</table>

Name of Union Steward or Co-worker Who May Have Been Present:

Did Management offer employee a drug test?  Yes or No

Did employee agree to a drug test?  Yes or No

What was employee’s explanation?

Employee’s Signature:  Date:
Witness’ Signature:  Date:
Supervisor Signature:  Date:

Title:

Action Recommended:

Action Taken:

Date/Time/Action Taken:

Report Date/Time:

Describe any suspicious errors or incidents:

__________________________________________________________

__________________________________________________________

Describe all other facts that cause you to suspect prohibited drug and/or alcohol use:

__________________________________________________________

__________________________________________________________

List all other witnesses to the employee’s appearance and conduct:

__________________________________________________________

__________________________________________________________

Supervisor No. 1 Signature  Supervisor No. 2 Signature
Appendix F

DRUG TEST COLLECTION/RESULT FORM

Job Name: _______________________________

Job Number: _______________________________

Reason for Drug Test:

_____ Pre-employment
_____ Reasonable Suspicion
_____ Post Incident
_____ Random
_____ Return-to-duty
_____ Follow-up

Applicant/Employee Name: _______________________________

Specimen Test Date: _______________________________

Employee Signature: ___________________________ Date: _______________________________

TEST RESULTS

_____ Negative

_____ Confirmation Required (indicate test required): _______________________________

Amphetamine                Cocaine                Opiate                PCP                THC

Tester: ___________________________ Date: _______________________________

Comments:

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________
SECTION 2.28 DIRECTIONAL DRILL RIG SAFETY

When directional drill rigs are in use by Kiewit Bridge & Marine and any subcontractors, procedures in compliance with the following shall be developed and followed.

Prior to the start of work, all utilities will be positively located and marked in compliance with the provisions in Section 2.11 (Excavation and Trenching Safety Rules). A detailed bore plan shall be developed and used in conjunction with the attached Bore Permit.

Directional drill rigs shall have working radio communication between the drill rig operator and the rig hand. If and when radio communication is interrupted the equipment will immediately be shut down and work stopped. All personnel working with the drilling operation will clear the area until radio communications are re-established.

The field superintendent shall designate one person as the “designated radio person”. Only one employee will give radio instructions to the drill rig operator. If the designated person is not on the work site, the rig superintendent will name another trained employee to assume the duties. The drill rig operator shall be informed of the change in designated personnel and accept instructions from this person only; except in the event of an emergency stop.

Follow “Equipment Lockout/Tagout” procedures as found in Section 2.9 when adding or removing drill heads and/or reamers. All work performed to equipment shall be done with the equipment turned off and locked out. As an added protection, the designated radio person will notify the drill operator to shut down the machine, lock it out, and step away from the controls.

The drill rig operator will stop the machine operation by engaging the emergency shut-off control or by killing the engine, and then step away from the controls. Prior to restarting the machine, the driller will be informed by the designated radio person that the situation is ‘all clear’ and it is safe to resume work.

Some of the directional drill rigs are equipped with an electronic lockout system. These rigs still require radio communication from the receiving pit to the machine operator.

Due to the high risk of injury associated with this type of work all drilling operations shall follow these safety controls:

- A documented daily safety meeting (written in a toolbox meeting book or on the back of the timecard) that includes a discussion on the following: safe lifting procedures, weather conditions, designated radio person, maintenance of 3-point contact getting on or off the machine, use of pipe wrenches on drill rods/drill steel, drill steel rotation, prohibition of loose clothing around equipment, and identification of first-aid trained personnel on the crew.

- A grounding rod shall be installed on each drill rig.

- The procedure and hazard analysis shall be reviewed each week at a minimum. Update the hazard analysis as conditions change.

- A traffic control plan that complies with the MUTCD or is agreed to by the local authorities must be used.

- Proper containment and disposal of drill mud. Drill mud shall not be permitted to enter into any waterway, storm drain, sewer, etc.
DIRECTIONAL DRILLING PERMIT

Step 1 – Superintendent

<table>
<thead>
<tr>
<th>C O N T R A C T O R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting Date:        Expected Completion Date:</td>
</tr>
<tr>
<td>Contractor:</td>
</tr>
<tr>
<td>Starting Location:    Ending Station:</td>
</tr>
<tr>
<td>Location:</td>
</tr>
<tr>
<td>Township:             County:                  State:</td>
</tr>
<tr>
<td>Superintendent:       Operator:</td>
</tr>
<tr>
<td>Crew:</td>
</tr>
</tbody>
</table>

- Work Plan Completed
- JHA Completed
- MOT Plan Completed

Permits Obtained:
- ROW
- Environmental
- Other:

Step 2 – Utility Locate Engineer

<table>
<thead>
<tr>
<th>C O N T R A C T O R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call Before You Dig / Dig Safe Ticket Number:</td>
</tr>
<tr>
<td>Activation Date:</td>
</tr>
<tr>
<td>Visual Check for Utilities Completed:</td>
</tr>
<tr>
<td>Overhead Wires that may interfere with operation:</td>
</tr>
<tr>
<td>Dangerous Utilities:</td>
</tr>
</tbody>
</table>

I, the Utility Locate Engineer, verify that all requirements have been completed and this area was properly located and potholed.

Utility Locate Engineer: Date:

Step 3 – General Superintendent / Segment Manager

<table>
<thead>
<tr>
<th>K I E W I T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bore Profile on file and reviewed: By:</td>
</tr>
<tr>
<td>Approved Pay Length:</td>
</tr>
<tr>
<td>Notes:</td>
</tr>
</tbody>
</table>

Superintendent: Date:
Segment Manager: Date:

Step 4 – Superintendent

<table>
<thead>
<tr>
<th>C O N T R A C T O R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checklist:</td>
</tr>
<tr>
<td>1. _____ Confirm Active Dig Ticket for Area</td>
</tr>
<tr>
<td>2. _____ Review All Utility Locate Information with Utility Engineer</td>
</tr>
<tr>
<td>• Pothole Drawings</td>
</tr>
<tr>
<td>• Utility Company Information</td>
</tr>
<tr>
<td>• Utility Emergency Contact Information</td>
</tr>
<tr>
<td>3. _____ Lockout / Tagout Procedure Reviewed with Crew?</td>
</tr>
<tr>
<td>4. _____ Confirm Mark-out and Pothole Information in the Field</td>
</tr>
<tr>
<td>5. _____ All Discrepancies must be reviewed with Utility Engineer</td>
</tr>
<tr>
<td>6. _____ Barrier placed over utility to Alert Construction Crew</td>
</tr>
<tr>
<td>7. _____ Utility Representative Onsite prior to Excavation (if required)</td>
</tr>
</tbody>
</table>

I, the Superintendent, understand that I must perform the following actions to assure that every effort has been taken to minimize the chance of a utility strike.

- Require that a person from the crew performs blind sweeps with a locator in front of the digging crew.
- Keep good communication between the crews and the Utility Locate Engineer.

Superintendent: Date:
LOCKOUT – TAGOUT PROCEDURE

This must be filled out, reviewed, and signed off on by the crew each day of drilling operations. It must also be present at the drill operation.

All lockout-tagout procedures shall include:

1. Key shall be removed from the drill rig while crew is working on the end of the drill steel, and the operator shall stand away from the drill rig.

2. A “Do Not Operate” tag shall be placed on the controls of the drill rig.

3. The key shall be in the possession of the crew working at the end of the drill steel until they are done, except for unusual situations such as a heavy highway traffic or impassable stream. In these cases extra safety measures must be employed.

4. A flag system shall be used whereby a red flag shall be displayed at the end of the drill steel whenever men are working on it. A red flag shall also be displayed at the drill rig to indicate that the operator acknowledges the lockout is in place.

5. Radio communication shall be maintained between the drill operator and the workers at the end of the drill steel.

6. Communications to resume the drilling shall be given to the drill operator by the foreman at the end of the drill steel.

7. The drill operator must repeat the instructions and have clear approval before resuming drilling.

8. Drilling cannot resume until the red flag is removed at the end of the drill steel.

9. Drilling cannot resume until the red flag is removed at the drill, after it is removed at the end of the drill steel.

The Lockout – Tagout Procedure for this bore shall be:

________________________________________________________________________
________________________________________________________________________

Bore Crew Reviewed Above Procedure: Date: _________________

1. _________________

2. _________________

3. _________________

4. _________________

5. _________________

Insert Hazard Analysis here:
## STEP BY STEP PLAN

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Verify all conflicting utilities/facilities</td>
</tr>
<tr>
<td>2.</td>
<td>Create a detailed bore plan</td>
</tr>
<tr>
<td>3.</td>
<td>Mobilize to work location</td>
</tr>
<tr>
<td>4.</td>
<td>Stretch and Flex / Tool Box Meeting</td>
</tr>
<tr>
<td>5.</td>
<td>Test Strike Alert and Eslok</td>
</tr>
<tr>
<td>6.</td>
<td>Equipment check and warm up</td>
</tr>
<tr>
<td>7.</td>
<td>Prepare entry pit and slurry control</td>
</tr>
<tr>
<td>8.</td>
<td>Drill pilot bore and monitor circulation</td>
</tr>
<tr>
<td>9.</td>
<td>Prepare exit pit and slurry control</td>
</tr>
<tr>
<td>10.</td>
<td>Push out rods for preream</td>
</tr>
<tr>
<td>11.</td>
<td>Remove dirt head / install prereamer</td>
</tr>
<tr>
<td>12.</td>
<td>Preream and monitor circulation</td>
</tr>
<tr>
<td>13.</td>
<td>Prepare product for installation</td>
</tr>
<tr>
<td>14.</td>
<td>Remove prereamer at rig &amp; install product reamer at exit</td>
</tr>
<tr>
<td>15.</td>
<td>Attach product to product reamer</td>
</tr>
<tr>
<td>16.</td>
<td>Install product</td>
</tr>
<tr>
<td>17.</td>
<td>Clean up equipment, bore pits and work location</td>
</tr>
<tr>
<td>18.</td>
<td>Secure equipment and mobilize to next location</td>
</tr>
</tbody>
</table>

## POTENTIAL PINCH POINTS ON TYPICAL HORIZONTAL DIRECTIONAL DRILLS

<table>
<thead>
<tr>
<th>Pinch Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment doors, latches, seat swivels, accessories</td>
</tr>
<tr>
<td>Rotating anchors / anchor motors, sliding anchor guides / posts</td>
</tr>
<tr>
<td>Track drives, rollers, tensioners</td>
</tr>
<tr>
<td>Anchor Platform</td>
</tr>
<tr>
<td>Rod loading shuttles, arms, baskets, boxes, rigging and rods</td>
</tr>
<tr>
<td>Pinching / rotating breakout wrenches</td>
</tr>
<tr>
<td>Rotating gear box, drill string (rods), drill head, reamer</td>
</tr>
<tr>
<td>Reciprocating high pressure mud pump</td>
</tr>
<tr>
<td>Traveling gearbox, drill string, drill head, reamer, product pipe</td>
</tr>
<tr>
<td>Mud supply hoses (cam locks)</td>
</tr>
<tr>
<td>Flexible hose / cable carriage attached to gearbox</td>
</tr>
<tr>
<td>High pressure hydraulic and mud hoses (vibration)</td>
</tr>
<tr>
<td>Pivoting gearbox rack (drill rack)</td>
</tr>
</tbody>
</table>

## HIGH RISK ACTIVITIES WHILE WORKING ON OR NEAR A HORIZONTAL DIRECTIONAL DRILL

<table>
<thead>
<tr>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working on drill string at the drill or at the exit side</td>
</tr>
<tr>
<td>Drilling across or parallel to existing utilities</td>
</tr>
<tr>
<td>Working near rotating drill tooling at the drill or at the exit side</td>
</tr>
<tr>
<td>Working in congested urban areas or utility corridors</td>
</tr>
<tr>
<td>Working near drilling tooling at the drill or at the exit side</td>
</tr>
<tr>
<td>Working under or near overhead power / communication cables</td>
</tr>
<tr>
<td>Handling loose drill pipe or baskets of drill pipe</td>
</tr>
<tr>
<td>Working near open water or unstable geology</td>
</tr>
<tr>
<td>Breaking out / making up tool joints at the drill or at the exit side</td>
</tr>
<tr>
<td>Walking on slopes or rough terrain between the drill and the exit side</td>
</tr>
<tr>
<td>Working in or near open excavations</td>
</tr>
<tr>
<td>Manually lifting drilling tools, equipment and supplies</td>
</tr>
<tr>
<td>Working with poor communications</td>
</tr>
<tr>
<td>Working in muddy conditions</td>
</tr>
<tr>
<td>Working near the drill track drives, anchor platforms, or drill rack</td>
</tr>
<tr>
<td>Working with poor visibility</td>
</tr>
<tr>
<td>Working on pumps, hoses or drill string while under fluid pressure</td>
</tr>
<tr>
<td>Working in inclement weather</td>
</tr>
<tr>
<td>Working on or near hot muffler / engine / hydraulics</td>
</tr>
<tr>
<td>Working in areas exposed to pedestrian traffic</td>
</tr>
<tr>
<td>Working near roadways or railroad track</td>
</tr>
</tbody>
</table>

## POTENTIAL PINCH POINTS ON TYPICAL DRILLING MUD MIXING / RECYCLING SYSTEMS

<table>
<thead>
<tr>
<th>Pinch Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment doors, latches, accessories</td>
</tr>
<tr>
<td>Vibrating shale shaker</td>
</tr>
<tr>
<td>Rotating pumps / pump drive motors</td>
</tr>
<tr>
<td>Mud supply hoses (cam locks)</td>
</tr>
<tr>
<td>Mud gates / valves / handles</td>
</tr>
<tr>
<td>Generator / engine rotating components</td>
</tr>
<tr>
<td>Folding ladders / catwalks</td>
</tr>
<tr>
<td>High pressure water from washing unit</td>
</tr>
<tr>
<td>Material handling, pallets, bags, pails</td>
</tr>
</tbody>
</table>
### HIGH RISK ACTIVITIES WHILE WORKING ON OR NEAR DRILLING MUD MIXING / RECYCLING SYSTEMS

<table>
<thead>
<tr>
<th>Activity</th>
<th>Precautionary Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working in dusty / windy conditions</td>
<td>Manually handling hoses when transferring mud / water under pressure</td>
</tr>
<tr>
<td>Using high pressure water washer</td>
<td>Working on elevated platforms</td>
</tr>
<tr>
<td>Mounting and dismounting the unit</td>
<td>Working in slippery conditions</td>
</tr>
<tr>
<td>Manually lifting bags, pails</td>
<td>Working near vibrating shale shaker</td>
</tr>
<tr>
<td>Working near rotating pumps and pump drives</td>
<td>Working on or near hot muffler + F44 / engine / hydraulics</td>
</tr>
<tr>
<td>Operating mud gates / valves / handles</td>
<td></td>
</tr>
</tbody>
</table>

### Verification of Conflicting Utilities / Facilities – A94

<table>
<thead>
<tr>
<th>Potential Hazard:</th>
<th>Precautionary Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owners cannot identify all expected facilities</td>
<td>Sweep area with all available devices</td>
</tr>
<tr>
<td>Damage caused to facilities during verification</td>
<td>Pothole across the running line at regular intervals until all expected facilities are verified</td>
</tr>
<tr>
<td>Traffic, Pedestrians, trains</td>
<td>Use care when hand digging or exposing the facilities using non-mechanical methods</td>
</tr>
<tr>
<td>Traffic, Pedestrians, trains</td>
<td>Notify Segment Manager and the respective utility owner if damage to facilities occur</td>
</tr>
<tr>
<td>Traffic, Pedestrians, trains</td>
<td>Secure Excavation Permit from Utility Superintendent before mechanical excavation</td>
</tr>
<tr>
<td>Traffic, Pedestrians, trains</td>
<td>Use traffic control, barricades, fencing, and positive protection from trains (flaggers)</td>
</tr>
<tr>
<td>Disturbing cultural / environmental resources</td>
<td>Consult Action List to identify cultural / environmental locations and monitoring requirements</td>
</tr>
</tbody>
</table>

### Create a detailed Bore Plan – A61

<table>
<thead>
<tr>
<th>Potential Hazard:</th>
<th>Precautionary Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic, Pedestrians, trains</td>
<td>Use traffic control, barricades, fencing, and positive protection from trains (flaggers)</td>
</tr>
<tr>
<td>Slips, trips and falls during investigation</td>
<td>Proceed through wooded areas and across slopes with caution</td>
</tr>
<tr>
<td>Injuries from an animal, insect or plant</td>
<td>Proceed with caution, wear protective clothing, carry communication</td>
</tr>
<tr>
<td>Misrepresentation of existing utilities</td>
<td>Accurately identify verified utilities on Bore Profile and include pothole drawings in Bore Plan – keep at site</td>
</tr>
</tbody>
</table>

### Mobilize to work location – see Loading, Unloading, Parking and Equipment / Driving / Load Tie Down / Traffic Control Procedures

<table>
<thead>
<tr>
<th>Potential Hazard:</th>
<th>Precautionary Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic, Pedestrians, trains</td>
<td>Use traffic control, barricades, fencing, and positive protection from trains (flaggers)</td>
</tr>
<tr>
<td>Theft or vandalism</td>
<td>Lock equipment and park it in front of trailer hitches or other equipment</td>
</tr>
<tr>
<td>Future access</td>
<td>Erect a fence around the equipment, park parallel to roads, tracks</td>
</tr>
<tr>
<td>Park on high ground, not closer than 250’ from the nearest access road</td>
<td>Leave access for service vehicles to enter the right of way</td>
</tr>
<tr>
<td>Equipment inadvertently moving or rolling</td>
<td>Park on high ground, not closer than 250’ from the nearest access road</td>
</tr>
<tr>
<td>Equipment or loads shifting during transport</td>
<td>Lower all raised implements, set parking brakes and chock trailer wheels</td>
</tr>
<tr>
<td>Secure all loads and thoroughly inspect twice before moving</td>
<td></td>
</tr>
</tbody>
</table>

### Stretch and Flex Program / Tool Box Meeting – see Stretch and Flex Manual

<table>
<thead>
<tr>
<th>Potential Hazard:</th>
<th>Precautionary Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overexertion</td>
<td>Participate to the extent of your physical capability</td>
</tr>
<tr>
<td>Stretch to the point of comfortable extension, then relax, hold the stretch 5-15 seconds</td>
<td>Stretching should not be painful, avoid straining muscles</td>
</tr>
<tr>
<td>Non-participation</td>
<td>Participate – Stretch and Flex reduces muscle strains during regular working activities</td>
</tr>
<tr>
<td>The Tool Box meeting identifies better ideas, work site hazards, safe work practices, etc.</td>
<td></td>
</tr>
</tbody>
</table>
5. Test Zap-Alert and Eslok – see Operator and Safety Manuals

<table>
<thead>
<tr>
<th>Potential Hazard</th>
<th>Precautionary Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrocution, injury, death, equipment failure</td>
<td>LAY ground stake from drill rig on ground, do not allow to touch drill or other metal</td>
</tr>
<tr>
<td></td>
<td>Connect one Zap-Alert tester lead to the ground stake, the other to the drill frame</td>
</tr>
<tr>
<td></td>
<td>Press the TEST button on the Zap-Alert tester, the Zap-Alert alarm will sound</td>
</tr>
<tr>
<td></td>
<td>DO NOT hold both Zap-Alert tester leads and press the TEST button, shock will occur</td>
</tr>
<tr>
<td></td>
<td>Press the RESET button on the drill to stop the alarm, repeat procedure</td>
</tr>
<tr>
<td></td>
<td>DO NOT start drilling until proper operation of Zap-Alert is confirmed</td>
</tr>
</tbody>
</table>

If the Zap-Alert sounds, **ALL PERSONNEL ON THE GROUND MUST REMAIN STATIONARY AND NOT CHANGE THE ELECTRICAL STEP POTENTIAL OF THEIR BODY BY MOVING FEET OR HANDS FROM THEIR CURRENT POSITION.** The driller should press the Zap-Alert RESET button. If the Zap-Alert continues to sound, an electrical fault has likely occurred. The driller should then pull back the drill string as far as necessary, while pressing the Zap-Alert button at the end of each rod, until the Zap-Alert alarm stops. **GROUND PERSONNEL SHOULD NOT MOVE UNTIL THE ELECTRICAL UTILITY OWNER DE-ENERGIZES THE ELECTRICAL CIRCUIT.** See Utility Strike Procedure and PPE Procedure.

The Zap-Alert alarm may sound inadvertently during drilling operations. If the Zap-Alert alarm stops when the driller presses the Zap-Alert RESET button, **ALL GROUND PERSONNEL MUST REMAIN STATIONARY while the possible presence of electrical utilities is assessed. Normally, underground electrical circuits have a time-delay fuse that will reset within 30 seconds of a fault.** If the Zap-Alert alarm does not sound again, and the electrical utility owner does not report the presence of underground electrical facilities in the area, the driller should then move the drill string back and forth to determine if the Zap-Alert will sound again. If it does not sound, the electrical utility owner approves, AND there is **NO EVIDENCE OF THE PRESENCE OF ANY OTHER UNDERGROUND FACILITIES,** drilling operations can continue and ground personnel can begin regular activities. Drilling in close proximity to electrical facilities can inadvertently activate the Zap-Alert alarm.

Getting caught in rotating drill string or tooling

<table>
<thead>
<tr>
<th>Potential Hazard</th>
<th>Precautionary Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting caught in rotating drill string or tooling</td>
<td>The drill will not operate if the Eslok Belt Transmitter and Receiver / Transceiver box on the drill are not communicating. If the Belt Transmitter battery fails, or if the signal between the Belt Transmitter and the Receiver / Transceiver (drill) is interrupted it will not operate.</td>
</tr>
<tr>
<td></td>
<td>After starting the drill, the large RED Eslok indicator FAULT light on the Receiver / Transceiver box (beside the driller's seat) should be illuminated and the thrust and rotary functions should not operate.</td>
</tr>
<tr>
<td></td>
<td>To RESET the Eslok system, the Belt Transmitter must have a charged battery and a small GREEN light in the upper left corner (press the GREEN button on the Belt Transmitter to get a GREEN light in the upper left corner of the Belt Transmitter). The RESET button on the Receiver / Transceiver box on the drill must then be pressed to illuminate the GREEN light on the Receiver / Transceiver and activate the drilling functions.</td>
</tr>
<tr>
<td></td>
<td>The Eslok system should be tested at the beginning of each shift, before working on the drill string at the drill rig, and before working on the drill string at the exit side of every bore.</td>
</tr>
<tr>
<td></td>
<td>DO NOT start drilling until proper operation of Eslok system is confirmed</td>
</tr>
<tr>
<td></td>
<td>The Eslok system is NOT a replacement for RADIO COMMUNICATION between the operator and the exit side personnel. Drilling operations MUST NOT proceed without BOTH the Eslok and positive RADIO COMMUNICATION.</td>
</tr>
</tbody>
</table>
6. **Equipment check and warm up – see Daily Visual Checks handbook**

<table>
<thead>
<tr>
<th>Potential Hazard:</th>
<th>Precautionary Plan:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head, eye, hand injury during Visual Checks</td>
<td>Wear hard hat and safety glasses, use caution when using hands, turn ENGINE OFF if possible</td>
</tr>
<tr>
<td>Engine failure causing toxic spill</td>
<td>Check ground, frame, engine block, turbo for oil / water / coolant leaks</td>
</tr>
<tr>
<td>Engine failure causing injury or death</td>
<td>Apply all brakes and safety lock outs, lower raised equipment before Visual Checks</td>
</tr>
<tr>
<td>Equipment failure causing injury or toxic spill</td>
<td>Check engine exhaust for leaks, loose bolts, rain caps</td>
</tr>
<tr>
<td>Equipment failure causing injury</td>
<td>Check fuel tanks and hoses for leaks, breathers and fuel caps, fuel separators / filters</td>
</tr>
<tr>
<td>Equipment failure causing injury / environmental spill</td>
<td>Check circulating pumps for packing wear / adjustment</td>
</tr>
<tr>
<td>Equipment failure causing injury / environmental spill</td>
<td>Check shale shaker screens for deterioration, tears, holes</td>
</tr>
<tr>
<td></td>
<td>Check mud tanks for leaks, excessive rust</td>
</tr>
<tr>
<td></td>
<td>Check operation of mud valves and condition of mud hoses / connections</td>
</tr>
<tr>
<td></td>
<td>Check condition of electrical cords / hydraulic hoses and submersible pump</td>
</tr>
<tr>
<td></td>
<td>Check condition of fall protection and non-slip surfaces</td>
</tr>
<tr>
<td></td>
<td>Check mud pump for leaks, wear, packing adjustment, power end oil</td>
</tr>
<tr>
<td></td>
<td>Clean all water / mud filters / screens</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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SECTION 2.30 DESIGN OF LIFTING BEAMS AND SPREADER BARS

The use of lifting beams and spreader bars is common in structures work. This policy will serve as a design guideline in order to establish common design standards and meet applicable regulations. These devices are categorized as “below the hook lifting devices” as defined by ANSI/ASME B30.20. Below are a few points from this standard that must be considered when designing such devices.

1. **Section 20 – 1.2.2**
   “A lifter shall be designed to withstand the forces imposed by its rated load, with a minimum design factor of 3, based on yield strength, for load bearing structural components.” To comply with this section, use a load factor of 2.0 and design the components according to AISC ASD requirements. The maximum allowable stress per AISC is 0.667 Fy. This correlates to a 1.5 factor of safety against yield. Applying a 2.0 load factor will increase the factor of safety up to 3.0.

2. **Section 20 – 1.2.1**
   This section discusses the requirements for permanently marking the lifting beam or spreader bar with the rated load. A note shall be placed on all drawings to permanently etch with welding rod the rated load and the lifter-weight in a visible location. Painting this information or the use of tags does not satisfy this requirement.

3. **Section 20 – 1.4.2**
   This section discusses the requirements for a rated load test. Each lifter shall be tested to a minimum of 125% of the rated load. This requirement shall be placed on all drawings. This section discusses the proper methods and inspections relating to testing.

In addition to the above ANSI requirements, the following guidelines should be followed:

1. A registered professional engineer will stamp all lifting beam or spreader bar drawings. A copy of the drawings and calculations are to be sent to the District Engineer and a copy retained on the project. The job shall maintain a log with all picking beam and lifting device calculations in a filing system. The project engineer should maintain this log.

2. All rigging should be checked for geometric considerations as well as load capacity. The designed rigging should be specified on the drawing.

3. Sling angles significantly impact the design of these items. Sling lengths should be specified on the drawing.

4. Often a lifting beam or spreader bar can be used in different configurations. All possible load conditions must be analyzed. If required, a table of load ratings and loading configurations should be placed on the drawings.

5. Pad eyes should be investigated closely. A large beam and/or pad eye can have a significant eccentricity that will affect the design. A check of the shackle clearances should be made. Cheek plates are suggested on pad eyes to center the shackle and avoid side loading the pad eye.

6. Long spreader bars should be inspected for allowable tolerances. A maximum sweep should be specified on the drawings.

7. Any modifications or variances to the drawings need to be reviewed and a new drawing issued.
Spreader bars and picking beams are used in many applications in the field. These devices last for many years. Proper design on our part will provide for a safe and economical construction aid.

**Administration**

The Job Superintendent is responsible for the administration of this policy.
SECTION 2.31  EQUIPMENT MOVES

To and From Job Sites:
Company Owned or Long Term (30 days) Equipment Needs

Company Owned and Long Term equipment mobilization to and from job sites will be arranged through the District Equipment Manager. Such mobilization will follow the manufacturers guidelines and local weights and measures regulations.

On Site Equipment Moves

On site equipment moves will be arranged by competent project personnel and comply with equipment manufacturers guidelines and local weights and measures regulations. The District Equipment Manager can also provide support if needed. Equipment moves not covered in the manufacturers guidelines or operator’s manual will be considered special or non-typical.

Special/Non-typical Moves

Equipment moves, which have special circumstances and are not typical to our work, will require a written procedure approved by the Job Sponsor and District Equipment Manager. Special/Non-typical equipment moves will be handled on a case-by-case basis.

Major Crane Moves

A “Major Crane Move Permit” must be filled out prior to every Major crane move, by the operator, foreman and superintendent. A “Major Crane Move Permit” form can be obtained through the District Office.

This permit must be approved by the Job Superintendent before the major crane move can be made.

A major crane move includes, but is not limited to:

- Any move of lattice boom truck crane.
- Any move of a crawler or RT which involves unique conditions such as:
  - Significant ground slopes.
  - Long distance of travel.
  - Move at night.
  - Overhead or underground utilities are involved.
  - Questionable ground conditions exist.
  - Any other uncommon circumstance.
SECTION 2.32 DEAD PULLS WITH CRANES

Definition: A “Dead Pull” is defined as an unidentifiable or uncalculatable load.

Dead pulls with cranes require Job Superintendent approval for each application or operation. Dead pull operations require a specific Hazard Analysis that will include as a minimum, an approved rigging design, a thorough rigging inspection, a functional Load Moment Indicator (LMI), and the boom to be tied down using the auxiliary or second hoist line. The second line should be anchored as close to the load as possible to minimize side loading to the boom if an incident occurs.

When making dead pulls, allow only necessary personnel in the work area. Designate a single signal person to help the crane operator keep the boom centered over the load and assure a true vertical extraction.

Prior Job Sponsor approval is required for alternate “dead pull” operations if the above described provisions cannot be followed.
SECTION 2.33   RIVET BUSTERS

The use of rivet busters poses serious hazards for operators and any person standing near the work area. To use these tools safely, a thorough understanding of potential hazards and how to avoid them should be communicated with a thorough hazard analysis review and hands-on safety demonstration with the superintendent. Operation manuals provided by the manufacturer include detailed safety instructions and warnings and should be reviewed with the employee as part of the safety instruction prior to use.

The use of rivet busters will be strictly prohibited except when approved, in writing, on a case-by-case basis by the job superintendent. Rivet busters need strict control and training. Rivet busters should not be considered a standard tool on our projects.

When approved by the job superintendent, the specific use must have a detailed hazard analysis, which should take into consideration the following safe work practices:

Eye, Face and Body Protection

- Eye protection must be worn at all times by the employee engaged in the operation and anyone else in close proximity, including supervision. Cup-type goggles shall be used during any activity with rivet busters.
- In addition to goggles, employees must also wear an impact resistant face shield, which may be either the clear lens or mesh-style.
- During use, employees using the tool and those in close proximity will also wear long sleeved shirts, covering the arms, full-length.
- Steel toe above the ankle boots (or metatarsal guards) must be worn at all times by anyone operating, or in close proximity to, the use of rivet busters.
- Loose fitting clothing or jewelry of any type must not be worn when operating rivet busters.

Respiratory Protection

Rivet busters are commonly used on concrete and steel. Two specific hazards that may be encountered while rivet busting on either of these include silica and lead respectively.

Regulatory agencies, such as OSHA, require the implementation of feasible engineering and work practice controls to protect workers and to use worker rotation and respirators only as supplementary protection. Exposure conditions are affected by constant changes in work operations, crews, materials, equipment, and weather. Thus, supervisors must often be creative and flexible so that exposure remedies are practical, safe and suitable for the operation.

While many of the "fixes" are straightforward, optimum results require serious commitment from management and the active participation of workers. Integration of control measures with the work process throughout the life of the project is critical. Before controls are activated, both management and workers should be trained so that they understand the rationale behind the controls and proper operating procedures.

On many projects, engineering and work practice controls fail to reduce worker exposures of silica and lead below permissible exposure limits. In these cases, respirators are required to fully protect workers. In other words, engineering controls may not be the final solution – but they may reduce exposure enough so that air purifying respirators can be used safely. Regular cleanup of the work area, personal hygiene facilities and blood testing (for lead disturbing activities) are other major components of worker protection programs.
Vibration

Prolonged work with rivet busters may cause the worker physical discomfort and sometimes even physical disability. Those who work constantly with heavier tools may experience injury to wrists and elbow joints.

Working with tools that stroke or rotate rapidly may result in impaired circulation and pain in the fingers, especially in cold weather. The most common ailment of this kind is known as “vibration white finger” (Raynaud’s disease) or other vibration caused health disorders.

Preventive measures may include one of the following:

- Eliminating the need to use rivet busters.
- Rotation of work assignments to minimize repetitive use by one employee.
- The use of sponge rubber and cork holders.
- The use of impact resistant gloves and arm protection when using for any longer than one hour.

Noise

Prolonged exposure to noise caused by normal operation of pneumatic equipment may lead to hearing disorders. As a minimum, employees using rivet busters and those in close proximity shall be provided and use hearing protection at all times.

Tool Maintenance and Operation

- Never leave unattended equipment connected to its source of power.
- Never turn the tool towards your body or towards anyone else at any time.
- Establish a written procedure which prohibits the user from adjusting, removing or repairing the tool or tool steel without disconnecting the air supply and bleeding off all residual air pressure first. The throttle lever on the outside of the handle can easily be depressed during these activities and could potentially eject the tool steel and act as a projectile (see photo below).

Steel Breakage Prevention

- Keep hammer and chuck bushings in good condition. Replace excessively worn parts.
- Before exerting undue leverage on any tool, cut off the air supply.
- Keep all steel sharp. Dull tool steel can cause strain on the steel and allow premature breakage. Inspect tool steel carefully for cracks or damage and replace if observed.
- Before using in extremely cold weather, warm them slightly by keeping them in the office. Hardened tool steel loses 80-percent of its normal shock resistance at zero degrees Fahrenheit.
General Operating Instructions

- Ensure proper bit selection for the appropriate tasks.
- Consult the manufacturer's recommendations for safe use of their tools, including, but not limited to air pressures, lubrication hose size, connecting hoses and rating, and tool operation guidelines.
SECTION 2.34 STEPLADDERS

- This policy outlines the general information on use, specifications, inspections, and care of stepladders.

- Common stepladder hazards include instability and falls. For these reasons scaffold platforms or other engineered systems should be used in lieu of stepladders. Scaffolding systems generally have a wider footprint than a stepladder and thus have superior stability. Scaffolding platforms can be protected by guardrails and therefore provide superior fall prevention for our employees versus stepladders where guardrails are not present.

- Superintendents are responsible to analyze each work activity and decide whether to use scaffolding or stepladders.

- When stepladder use is selected, their use shall be specifically identified in a Job Hazard Analysis and approved, in writing, by the responsible Superintendent.

- The Job Hazard Analysis shall, at a minimum, address stability and fall hazards. Guidelines for these hazards are included below (see items 1 and 2 below).

- The following provides an outline for safe use of stepladders in a construction environment, and should be included as part of the operation-specific hazard analysis:

  1. Stability Issues:
     a. Stepladders must always be securely spread open. Never use a folding stepladder in an unfolded position or partially folded position.
     b. Stepladders will be provided with nonskid safety feet and placed on a stable base.
     c. Never reach too far to one side of a ladder. Always keep your body within the side rails and both feet on the steps.

  2. Fall Hazards:
     a. Face the ladder and maintain a three-point contact when ascending or descending the ladder. Do not hand-carry materials or tools on a ladder. Do not stand on the ladder’s top two steps and do not climb the cross braces on the rear of the ladder.
     b. When working from the fourth rung or below employees may work with only two points of contact (e.g. both feet firmly placed on a step).
     c. When working above the fourth rung the employee shall either maintain three points of contact (e.g. two feet and one hand touching the ladder at all times) or the employee must be tied off to an approved overhead anchorage system independent of the stepladder.
     d. When working at any level on a ladder adjacent to an edge such that the employee could fall more than six-feet the employee must be tied off to an approved overhead anchorage system independent of the stepladder.

  3. Review and comply with the manufacturer’s instructions for use.
4. Electrical shock can occur with metal ladders. Use only fiberglass ladders.

5. Stepladders will not be longer than 12 feet (3.7 meters) as determined by the front rail. Ladders purchased will be ANSI Type IA, Extra Heavy Duty Industrial Use (300 pound rating). Ensure the ladder is not loaded beyond the manufacturer’s weight capacity.

6. Maintain the ladder in good condition. A competent person must inspect ladders before each use for defects (e.g., broken or damaged components) and other conditions (e.g., grease, oil or mud). Tag a deficient ladder and remove it from service.

7. The access areas at the top and bottom of ladders will be kept clear of obstructions.

8. Training
   a. Each employee who uses ladders will be trained in the following areas, as applicable:
      i. The nature of fall hazards in the work area;
      ii. The proper construction, use, placement, and care in handling ladders;
      iii. The correct procedures for erecting, maintaining, and disassembling fall protection systems;
      iv. The maximum intended load-carrying capacities of the ladder used.

   b. Each employee will be retrained periodically so that they maintain the knowledge acquired through compliance with these requirements. Any employee who demonstrates a performance deficiency with regard to ladder use will be retrained immediately.
SECTION 2.35 HEARING CONSERVATION PROGRAM

Purpose

The purpose of the hearing conservation program is to avoid employment related hearing loss.

It has been determined that sound levels of 90 decibels (dB) over an 8 hour period on a daily basis may cause hearing loss. To prevent hearing loss, a hearing conservation program will be initiated whenever employee noise exposures equal or exceed an 8-hour time-weighted average (TWA) sound level of 85 dB measured on the A-scale weighting at slow response, or, equivalently, a noise dose of fifty percent.

Pile drivers and operators who may be assigned to pile driving should be given an audiogram to establish a baseline audiogram against which subsequent audiograms can be compared. Other employees who will be exposed to high noise levels will also be tested.

Annual audiometric testing will be conducted to document the effectiveness of our hearing conservation program.

Hearing protectors will be provided to all employees and should be worn whenever an employee cannot converse in a normal voice at arms length. Double hearing protection will be required during pile driving until noise monitoring results show that it is not required.

Actual noise exposure at the jobsite will be determined using sound level meter and noise dosimeter.

Introduction

The following program discusses the required components of the hearing conservation program.

Monitoring

The hearing conservation amendment requires employers to monitor noise exposure levels in a manner that will accurately identify employees who are exposed to noise at or above 85 decibels (dB) averaged over eight (8) working hours, called an 8-hour time-weighted average (TWA). The exposure measurements must include all noise within an 80 dB to 130 dB range and must be taken during a typical work situation. This requirement is performance oriented, since it allows employers to choose the monitoring method that best suits each individual situation.

Under this revised amendment, employees are entitled to observe monitoring procedures and they must be notified of the results of the exposure monitoring of their workplace. The method used to notify employees is left to the discretion of the employers.

Instruments used for monitoring employee exposures must be carefully checked or calibrated to ensure that the measurements are accurate. Calibration procedures are unique to specific instruments. Employers have the duty to assure that the measuring instruments they are using are properly calibrated. They may find it useful to follow the manufacturer's instructions to determine when and how extensively to calibrate.
### Permissible Noise Exposures

<table>
<thead>
<tr>
<th>Duration per Day (Hours)</th>
<th>Sound Level dBA Slow Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>90</td>
</tr>
<tr>
<td>6</td>
<td>92</td>
</tr>
<tr>
<td>4</td>
<td>95</td>
</tr>
<tr>
<td>3</td>
<td>97</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>1½</td>
<td>102</td>
</tr>
<tr>
<td>1</td>
<td>105</td>
</tr>
<tr>
<td>½</td>
<td>110</td>
</tr>
<tr>
<td>¼ or less</td>
<td>115</td>
</tr>
</tbody>
</table>

**Audiometric Testing**

Audiometric testing not only monitors the sharpness or acuity of an employee’s hearing over time, but also provides an opportunity for employers to educate employees about their hearing and the need to protect it. The important elements of an audiometric testing program include baseline audiograms, termination of employment audiograms, annual audiograms, training, and follow-up procedures. Audiometric testing must be made available to employees at no charge. And the audiometric testing program follow-up should indicate whether hearing loss is being prevented by the employer's hearing conservation program. A professional audiologist (specialist dealing with individuals having impaired hearing), an otolaryngologist (physician specializing in the diagnosis and treatment of disorders of the ear, nose, and throat), or a physician must be responsible for the program. Both professionals and trained technicians may conduct audiometric testing. The professional does not have to be present when a qualified technician is conducting the testing, however. The professional responsibilities include overseeing the program and the work of the technicians, reviewing problem audiograms, and determining whether the referral is necessary.

There are two types of audiograms required in the hearing conservation program: baseline and annual audiograms.

**Baseline Audiograms**

The baseline audiogram and termination of employment audiogram is the reference audiogram against which future audiograms are compared. Baseline audiograms will be provided for all current employees and new hires (no later than the first 6 months of employment). Projects may use mobile test vans to obtain audiograms. Employees must be issued and fit with hearing protectors, which will be worn until the baseline audiogram is obtained. Testing to establish a baseline audiogram shall be preceded by at least 14 hours without exposure to workplace noise.

**Annual Audiograms**

The annual audiogram must be conducted within one (1) year of the baseline. It is important to test hearing on an annual basis in order to identify changes in hearing ability so that protective follow-up measures can be initiated before hearing loss progresses. Annual audiograms must be routinely compared to baseline audiograms to determine whether the audiogram is accurate and to determine whether the employee has lost hearing ability (that is, if a standard threshold shifts (STS) has occurred). STS is defined in the amendment as an average shift in either ear of 10 dB or more at 2,000, 3,000, or 4,000 Hz. An averaging method of determining STS was chosen because it diminishes the number of persons who are later shown not to have had a change in hearing ability.
**Audiogram Evaluation**

If an STS is identified, employees must be fitted or refitted with adequate hearing protectors, shown how to use them, and required to wear them. Employees must be notified within twenty-one (21) days from the time the determination is made that their audiometric test results showed an STS. Some employees with an STS may need to be referred for further testing, if the professional determines that their results are questionable or if they have an ear problem of a medical nature which is thought to be caused or aggravated by wearing hearing protectors. If the suspected medical problem is not thought to be related to wearing protectors, employees must be informed that they should see a physician. If subsequent audiometric tests show that the STS identified on a previous audiogram is not persistent, employees whose exposure to noise less than a TWA of 90 dB may discontinue the wearing of hearing protectors.

A subsequent audiogram may be substituted for the original baseline audiogram if the professional supervising the program determined that the employee’s SES is persistent. This substitution will ensure that the same shift is not repeatedly identified. The professional may also decide to revise the baseline audiograms if an improvement in hearing has occurred. This will ensure that the baseline reflects actual hearing thresholds to the extent possible.

**Hearing Protectors**

Hearing protectors must be available to all employees exposed to 8-hour time-weighted average noise levels of 85 dB or above. This requirement will ensure that employees have access to protectors before they experience a loss in hearing. Hearing protectors must be worn by employees exposed over the permissible level, an 8-hour time-weighted average of 85 dB or above.

Employees should decide, with the help of a person whose is trained in fitting hearing protectors, which size and type protector is most suitable for their working environment. The protector selected should be comfortable to wear and offer sufficient attenuation to prevent hearing loss.

Hearing protectors must adequately reduce the severity of the noise level for each employee’s work environment. The employer must re-evaluate the suitability of the employee’s present protector whenever there is a change in working conditions that may cause the hearing protector to be inadequate. If workplace noise levels increase, employees must be given more effective protectors. The protector must reduce employee exposures to at least 85 dB. Employees must be shown how to use and care for their protectors and must be supervised on the job to ensure that they continue to wear them correctly.
# Appropriate Hearing Protection Devices

<table>
<thead>
<tr>
<th>Type</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ear Muffs</strong></td>
<td>➢ One size fits most adults.</td>
<td>➢ Usually have a lower noise reduction rating than ear plugs, but still provide effective protection.</td>
</tr>
<tr>
<td></td>
<td>➢ Can easily be seen at a distance.</td>
<td>➢ They are bulky and cannot fit in pockets or stored in tool kits.</td>
</tr>
<tr>
<td></td>
<td>➢ Can be put on, adjusted, etc. while wearing gloves.</td>
<td>➢ May interfere with and not sit properly when glasses, hearing aids, etc. are worn. Because of their</td>
</tr>
<tr>
<td></td>
<td>➢ Can be warming to the ears in cold environments.</td>
<td>size, may not be suitable for the work quarters.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ Excessive heat and sweat accumulation may make them uncomfortable to wear in hot locations.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ Are more difficult to clean than ear plugs.</td>
</tr>
<tr>
<td><strong>Ear Plugs</strong></td>
<td>➢ Have highest noise reduction rating and are very effective in protecting your hearing when worn properly.</td>
<td>➢ Fitting can be complicated. Ear canals vary in diameter and the left and right ear canals are not</td>
</tr>
<tr>
<td>(2 types)</td>
<td>➢ Do not interfere with work in close quarters.</td>
<td>necessarily similar in size, shape, or position.</td>
</tr>
<tr>
<td></td>
<td>➢ Are easily carried and stored when not in use.</td>
<td>➢ Can be easily left in other work clothes or fall out of a jacket or shirt pocket and become lost.</td>
</tr>
<tr>
<td></td>
<td>➢ Compatible with glasses or any other type of head gear without affecting performance.</td>
<td>➢ Cannot be seen at a distance which makes it difficult to evaluate if person is wearing them.</td>
</tr>
<tr>
<td></td>
<td>➢ Can be easily cleaned.</td>
<td>➢ Gloves must be removed and hands washed prior to putting in ear plugs.</td>
</tr>
</tbody>
</table>

- **Ear Plugs (2 types)**: Pre-formed, Expandable
Warning Signs

Signs shall be posted at entrances to or on the periphery of all well defined work areas in which employees may be exposed at or above 115 dBA, no matter what the noise is or how long its duration. Warning signs shall clearly indicate that the area is a high noise area and that hearing protectors are required.

Recordkeeping

Noise exposure measurements records will be kept for two (2) years. Records of audiometric test results must be maintained for the duration of employment of the affected employee.

Audiometric test records must include:

- Name
- Social Security Number
- Job classification of the employee
- Date
- Examiner’s name
- Date of acoustic or exhaustive calibration

Measurements of the background sound pressure levels in audiometric test room’s employee's most recent noise exposure measurement.
SECTION 2.36 CHAIN RIGGING

The use of chain rigging is strictly prohibited for general lifting applications. Chain rigging is only permitted in specialized rigging applications where the use of wire rope or synthetic slings would not provide adequate load position or stability. In such cases the rigging will be certified and rated chain conforming to all applicable standards, codes, and inspection prior to use. In addition, approval is required from the Job Sponsor first and then by the District Safety Manager. The following materials will need to be provided for approval and available at the location of the lift.

- Proof that chain rigging is the best choice.
- A specific description of the chain rigging including capacity ratings.
- A description of the formal inspection process.
- A detailed rigging diagram plan.
- A detailed plan to train riggers and operators of the District’s Policy and the proper usage and inspection of the chain rigging.

**Note:** A “Job Hazard Analysis” and an “On the Spot Lift Plan” are required any time we make a pick. When using Chain Rigging, the Superintendent needs to verify all of the rigging has been inspected, meets the rigging diagram, and that the riggers have been trained.

Project: ___________________________ Operation: ___________________________

Project Manager: ___________________________ Superintendent: ___________________________

Foreman: ___________________________ Engineer: ___________________________

Rigging Plan Approved by Job Sponsor: ___________________________ Date: ___________________________

Rigging Plan Approved by District Safety Manager: ___________________________ Date: ___________________________
SECTION 2.37 ASBESTOS AND LEAD

If an employee suspects asbestos or lead in any material they are working with, they are instructed to leave the material and the area and report the material to their supervisor. At that time, the supervisor will conduct an investigation and develop a plan to handle the material.

At no time are our employees allowed or expected to handle or abate any materials containing asbestos or lead. We will only do work in areas suspected of asbestos or lead containing materials if we have documentation that the area has been abated by a qualified abatement contractor; or in the circumstances where an abatement plan approved by the District Safety Manager is in place.

Kiewit Bridge & Marine is not an abatement contractor; therefore, in the instance we do take on work containing asbestos or lead we will develop an abatement plan that will be job specific and approved by the District Safety Manager.
SECTION 2.38 BLOODBORNE PATHOGENS

Purpose

To protect exposed employees from hazards associated with bloodborne pathogens, in particular HIV and Hepatitis B Virus. To prevent employees that are administering first aid resulting from an accident, such as, a serious laceration from work tools.

Definitions

• **Blood**: Human blood, human blood components, and products made from human blood.

• **Bloodborne Pathogens**: Pathogenic microorganisms that are present in the human blood and can cause disease in humans.

• **Contaminated**: The presence or the unreasonably anticipated presence of blood or other potentially infectious materials on an item or surface.

• **Occupational Exposure**: Reasonably anticipated skin, eye, mucous membrane, or potential contact with blood or other potentially infectious materials that may result from the performance of an employee’s duty.

• **Potential**: Piercing mucous membranes, or the skin barrier through such events as needle sticks, human bites, cuts or abrasions.

Exposure Determination

Kiewit Bridge & Marine employees have very little risk in being exposed to bloodborne pathogens, unless in close proximity of an occupational accident or when designated to administer first aid practices. Employees administering first aid are the affected employees who are considered exposed or will be potentially exposed, to blood and/or other potentially infectious materials.

Exposure Control

• Universal precautions must be observed to prevent contact with blood or other potentially infectious materials.

• When at all possible victims of minor injury shall perform first aid to themselves under the supervision of a certified first aid individual.

• When first aid assistance is needed first aid trained employees must wear the appropriate **Personal Protective Equipment**.

• Disposable rubber or vinyl gloves.

• Pocket masks or mouth pieces for CPR.

• All employees exposed to blood or other potentially infectious materials must wash and clean exposed areas of their bodies before returning to work.

• All work areas, materials and equipment must be cleaned after contact with blood or other possibly infectious material.
• All contaminated materials must be properly collected, sealed in a plastic container for proper disposal.

**Engineering Controls**

• Kiewit Bridge & Marine will provide hand washing facilities where possible. In case a hand washing facility is impractical First Aid Kits will provide antiseptic cleansers or towelettes.

• Proper PPE will be provided: gloves, face shields for CPR, eye protection.

• Orientation of employees to first aid supplies and PPE in the **Safety Orientation Checklist**.

**Post Exposure Evaluation and Follow-up**

Immediately available after an exposure incident the employee will be provided a confidential medical evaluation and follow-up including:

• Documentation of the route of exposure, and the circumstances of the exposure incident.

• Identification and documentation of the source individual.

• Medical evaluations, testing and post exposure treatments will be made available to exposed employee.
SECTION 2.39  EMERGENCY PROCEDURE PLAN

Kiewit Bridge & Marine will provide first aid, medical services, and emergency transportation for employees who incur occupational injuries or illnesses. The Site Manager is responsible for coordinating jobsite emergency procedures. All project supervision are encouraged to have a current First Aid and CPR card. Periodic classes will be offered at no cost to employees.

- Eye treatment will be performed by the Safety/First Aid staff and then followed up by the clinic.
- Each job must have an emergency action plan with directions to the nearest clinic.

First Aid Procedure

First Aid facilities shall have emergency telephone numbers posted on all first aid kits. First aid supplies shall be readily accessible when required. The size and quantity of first aid kits, required to be located at any site, shall be determined by the number of personnel. The number of first aid kits required for the number of employees is in the OSHA Construction Standard.

A designated clinic will be established to treat injuries that require medical treatment.

If it is determined that medical attention is required (visit to doctor or clinic), a staff member shall accompany the injured individual.

Emergency

Correct reporting of accidents, injuries, or severe illness is important to ensure prompt and correct handling of the situation.

Preplanning when setting up a new job location should include calling the non-emergency phone number of the local fire and ambulance service. Explain you are setting up a jobsite and would like to invite the emergency response team to make a preplanning trip to the site. This process will generate the following information:

- Who will respond – City, County, private, etc.?
- How long will response take?
- Where do you send an employee to flag them on site?
- What are their capabilities? Can they rescue a fall from elevation hanging from a lanyard? Will they do confined space rescue? Where do they take injured workers?
- Is your jobsite response friendly? Is access adequate and well marked?

Preplanning also includes working with a local clinic to build a relationship. The clinic should be advised of our strong safety program and our desire to keep people working if possible. We have useful positions available that can accommodate almost any level of injury.

Chemical Spills

If there has been a chemical spill, contact your supervisor. DO NOT attempt to clean up a chemical spill with any other chemicals until the spilled chemical is identified and proper clean-up procedures are found. If you are unsure of the chemical's properties, or it is spilled in massive quantities, evacuate the area and call your Project or District Environmental Manager.
Fire

In case of fire, call authorities immediately and evacuate the area. Fire fighting efforts may begin with the first responders. All Kiewit Bridge & Marine employees are instructed to maintain a safe distance from the fire. A fire extinguisher will be located in the shop, office, or common areas of each Jobsite.

Violence

In the event of violence in the workplace, the police should be called immediately. It is imperative that our employees avoid confrontational situations and acting as a mediator. You are instructed to contact your supervisor and authorities for help.

Fatalities

In the event of an occupational fatality, we must immediately contact authorities. The Department of Labor and Industries will conduct an investigation. The District Office should be contacted immediately following the contact of authorities.

Required Information

Steps Taken for Major Injuries That Require an Ambulance

A. Notify a supervisor IMMEDIATELY.
B. Supervisor or foreman will call:
   1. The field office by radio if no phone is immediately available.
   2. Call the Fire Department if "911" is available; if not, call the number specified for that jobsite.
C. When you make the call, give:
   1. Your name.
   2. Location: street address and directions to site must be posted to assist emergency personnel.
   4. Designate two people: one to meet the ambulance, and the second to secure the site.
D. Don't move any injured personnel until directed by the Emergency Personnel unless the hazard endangers their lives.

What to do Until Help Arrives

A. Whatever First Aid can be done (stop or control bleeding, perform CPR, etc.). Take precautions to avoid exposure to the injured workers blood and other body fluids, treat these as a hazardous material. Personal protective equipment such as CPR microshield mouth barriers, disposal vinyl gloves, and infectious waste disposal bags should be used.
B. Keep the patient warm.
C. DO NOT MOVE THE PATIENT unless there is danger of further injury.
D. Keep the patient quiet if possible.
E. Keep crowds to a minimum. Only those administering first aid or those needed to move stretcher(s), etc., should be allowed near the scene.
F. Only those vehicles required in transport of the patient should be allowed in the area.
G. Assign someone to guide the ambulance.

Notifications

Call the District Safety Manager immediately, followed with calls to the District Manager, Assistant District Manager, and Area Manager.
SECTION 2.40  FIRE PREVENTION AND PROTECTION

General Requirements

Fire protection requirements shall be followed throughout all phases of construction and demolition work. There shall be firefighting equipment provided as specified in this section. As fire hazards occur, there shall be no delay in providing necessary protection. The following conditions need to exist throughout the duration of the project:

- Access to all available firefighting equipment.
- Firefighting equipment will be provided by the project.
- All firefighting equipment shall be inspected by a competent person and properly maintained.
- A log of each inspection shall be kept on the project.
- All equipment shall be maintained in operating condition.
- Defective equipment shall be immediately replaced.
- Isolated or potential high risk projects shall be assigned a trained and equipped fire fighting group (fire brigade) to assure adequate protection to life and property.

Fire Classification

Fires are classified on the basis of combustible material. The three basic types of fire are classified as being:

- Class A: Ordinary combustible materials, such as wood, coal, paper or fabrics.
- Class B: Flammable liquids (and gasses) such as gasoline, paints and flammable solvents.
- Class C: Fires in or near energized electrical equipment.

For Class A, B, and C fires it is suggested that persons attempting to extinguish the fire use an ABC dry chemical type extinguisher.

Flammable and Combustible Liquid

- Flammable liquids (e.g., gasoline, acetone, denatured alcohol) will not be used for cleaning.
- Flammable/combustible solvents will not be used near ignition sources.
- Flammable liquids will be handled and used only in approved, properly labeled, safety cans.
- Smoking will be prohibited where refueling activities are in progress.
- Fuel cans shall be placed on the ground for filling to avoid the build-up of a static charge generated by the fuel flowing into the can.
- Combustible liquids, including oil or grease, will be stored in approved, covered metal containers.

Fire Extinguishers

Fire extinguishers will be available when the project begins.

Per OSHA Guidelines, fire extinguishers will be:

- Conspicuously placed and clear access to each will be maintained. Employees will be trained in the use of fire extinguishers.
- Inspected, tested, and maintained in accordance with applicable codes/standards such as those established by the National Fire Protection Association (NFPA).
- Replaced immediately after discharge with another fire extinguisher that is fully charged and of the proper size and type.
SECTION 2.41 HEAT AND COLD STRESS PREVENTION

General Requirements

Each project should conduct a risk assessment that considers the specific work conditions and environments to be encountered during the life cycle of the project. Based on the risk assessment, requirements that address heat and cold stress exposure shall be developed in the project's Safety and Health Plan.

The effects of work in hot or cold environments depend on factors such as:

- Air temperature and wind.
- Duration of exposure.
- Type of protective clothing and equipment.
- Type of work.
- Level of physical effort.
- Health status of the employee.

In addition, the use of protective clothing (full body suits for hazardous material exposure, heavy clothing/leathers, or any barrier that limit air movement), respirators, and work in confined spaces can increase or compound the risks to the worker, especially in hot environments.

Toolbox Talks and Two Minute Minders should address the potential for heat/cold stress, where applicable.

Heat Stress

Employees who have symptoms or conditions of heat stress, heat stroke, and/or heat exhaustion should notify their foreman or superintendent.

Causes and Symptoms

Heat stress may occur any time that work is being performed at elevated temperatures or when protective clothing is worn.

Heat stress symptoms include fatigue, irritability, anxiety, and decreased concentration, dexterity, or movement. If the body's physiological processes fail to maintain a normal body temperature because of excessive heat, a number of physical reactions can occur ranging from mild to fatal. Because heat stress is one of the most common and potentially serious problems that workers encounter, regular monitoring and preventive measures are vital.

Employees must learn to recognize and treat the various forms of heat stress.

Preventive Measures

Projects should follow these measures to avoid heat stress:

- Provide fresh drinking water and make it easily accessible.
- Urge employees to drink 5-8 liters of water per day.
- Discourage the use of alcohol during non-working hours, and discourage the intake of coffee during working hours.
- Monitor employees for signs of heat stress.
• An employee with high blood pressure should be monitored often, and extra precautions should be taken.
• Ensure that adequate shelter is available to protect personnel from heat, as well as cold, rain, or snow, which can decrease physical efficiency and increase the probability of both heat and cold stress.
• Provide initial and on-going training regarding heat stress recognition and prevention.

**Heat Stress Disorders**

A number of disorders associated with excessive exposure to hot working conditions can pose serious, even life threatening effects on individuals.

**Heat Rash**

Heat rash is caused by continuous exposure to heat and humid air and is aggravated by chafing clothes. The condition decreases a person’s ability to tolerate heat.

*Symptoms:*
The symptoms of heat rash include mild, red rash, especially on areas of the body in contact with protective gear.

*Treatment:*
Heat rash is treated by decreasing the amount of time workers wear protective gear and by applying powder to affected areas to help absorb moisture and decrease chafing.

**Heat Cramps**

Heat cramps are caused by perspiration that is not balanced by adequate fluid intake. Heat cramps are often the first sign of a heat exposure situation that can lead to the more serious condition of heat stroke.

*Symptoms:*
Heat cramps are characterized by acute painful spasms of the voluntary muscles (e.g. abdomen and extremities).

*Treatment:*
Move the victim to a cool area and loosen clothing. Have the victim drink 250-500 ml of water immediately and every 20 minutes thereafter until symptoms subside. Total water consumption should be 5-8 liters per day. Consult a physician.

**Heat Exhaustion**

Heat exhaustion is a state of weakness or exhaustion caused by the loss of fluids from the body. This condition, although less dangerous than heat stroke, must be treated.

*Symptoms:*
The symptoms of heat exhaustion include pale, clammy, moist skin; profuse perspiration; and extreme weakness. The body temperature is normal, the pulse is weak and rapid, and breathing is shallow. The victim may have a headache, may vomit, and/or may be dizzy.

*Treatment:*
Move the victim to a cool place, loosen clothing, place the victim in a head – low position, and provide bed rest. The normal thirst mechanism is not sensitive enough to ensure body fluid replacement.
Have the victim drink 250 ml of water immediately and every 20 minutes thereafter until symptoms subside. Total water consumption should be about 5-8 liters per day. Consult a physician, especially in severe cases.

**Heat Stroke**

Heat stroke is an acute and dangerous reaction to heat stress caused by failure of the heat-regulating mechanisms of the body. During an episode of heat stroke, the body temperature can rise so high that brain damage and death may result if the person is not cooled quickly.

**Symptoms:**
The symptoms of heat stroke include red, hot, dry skin (although the person may have been sweating earlier); nausea; dizziness; confusion; extremely high body temperature; rapid respiratory and pulse rate; and unconsciousness or coma.

**Treatment:**
The victim of heat stroke should be cooled quickly to prevent permanent brain damage or death. Soak the victim in cool but not cold water, sponge the body with cool water, or pour water on the body to reduce the temperature to a safe level, 102 degrees Fahrenheit. Do not give the victim coffee, tea, or alcoholic beverages. Observe the victim and obtain medical help.

**Cold Stress**

Over exposure to cold environments can have serious effects on exposed body surfaces or deeper body tissues.

**Treatment of Cold Disorders**

The intent of all treatment is to increase the core body temperature to 98.6 degrees Fahrenheit.

Symptoms include heavy shivering, drowsiness, excessive fatigue, and confusion.

Cold weather work should be discontinued for any worker with these symptoms, and the worker should be taken to a warm area. Wet clothing should be removed if possible and replaced by dry clothing. A warm, nonalcoholic, non caffeine drink or soup may be given. Re-warming should be gradual.

**Preventative Measures**

The following precautions should be taken to avoid cold stress:

- Workers should be trained in the recognition of symptoms, treatment of cold stress disorders.
- Appropriate and suitable clothing must be worn. Clothing should consist of a base layer, intermediate layer and appropriate out garments.
- Extremities of the body should be protected adequately.
  - Hands should be covered with gloves.
  - Caps, hoods, or hard hats with liners should be used to cover the head and ears.
  - Feet should be protected with insulated boots, layers of socks, or boot covers, as appropriate.
- Workers should keep on hand a change of clean dry clothing.
- Workers should consume warm, nonalcoholic drinks (avoid or minimize coffee or other liquids containing caffeine) and/or soups.
Cold Stress Disorders

Overexposure to cold environments can have serious effects on exposed body surfaces or deeper body tissues.

Frostbite

Frostbite occurs when there is actual freezing of the body tissues, normally when temperatures are below freezing. The injury can result from exposure to cold wind, from prolonged exposure to cold temperatures, or from skin contact with an object whose temperature is below freezing.

The tissue damage can be superficial near the skin or extend to deeper body tissues and cause gangrene. The skin may first have a prickly or tingling sensation and later become numb with cold; the appearance may range from superficial redness of the skin to white frozen-looking tissues.

Symptoms:
The skin may start with a prickly or tingling sensation. Skin sensation progresses to numb with cold. Appearance at start is a superficial redness of the skin. Appearance progresses to white frozen-looking tissues ridged or wooden to the touch.

Treatment:
The victim should be sheltered from the wind and cold and given warm drinks. The victim should be covered with warm clothing or blankets.

Do NOT use direct heat and do NOT rub the affected area. Warming should be rapid but gentle.

Hypothermia

Hypothermia results when the body loses heat faster than it can be produced. This causes the blood vessels in the skin to constrict in order to conserve important vital heat. Hands and feet are usually affected first. As the body tries to produce more heat, involuntary shivering begins.

Symptoms:
Uncontrollable shivering and inability to warm-up, confusion, forgetfulness, irritation, clumsiness, slurred speech, blurred vision, loss of manual dexterity and lack of coordination, despair and disinterest, ashen white face and hands, shivering replaced by muscle rigidity, paradoxical stripping of clothes as cold impairs thermo-regulation to center of brain, incoherence and collapse; unconsciousness.

Treatment:
Encourage physical activities to generate muscle heat. Replace wet clothing with dry layers, covering the head and neck. Apply hot packs, or water bottles. Supply hot decaffeinated and alcohol-free drinks.

Immersion Foot or Trench Foot

These two cold injuries occur as a result of exposure to cool or cold water.

Immersion foot usually results from prolonged exposure when air temperatures are above freezing, whereas trench foot normally occurs from shorter exposure at temperatures near freezing.

The symptoms for each disorder are similar and include tingling, itching, swelling, pain in some cases or numbness in others, lack of sweating, and blisters.
SECTION 2.42 WORKPLACE VIOLENCE

Purpose

To define the policy of this company that all employees have the right to work in an environment free from physical violence, threats, and intimidation.

Kiewit Bridge & Marine believes that violence is a form of serious misconduct that undermines the integrity of the employment relationship. No employee should be subject to unsolicited and physical violence, threats, or intimidation. Such behavior may result in disciplinary action up to and including dismissal.

Policy

Kiewit Bridge & Marine has a strong commitment to its employees to provide a safe, healthy and secure work environment. Kiewit Bridge & Marine also expects its employees to maintain a high level of productivity and efficiency. The presence of weapons and the occurrence of violence in the work place during working hours or otherwise are inconsistent with these objectives. While the Company has no intention of intruding into the private lives of its present or potential employees, it expects all employees to report on the work site without possessing weapons and to perform their job without violence towards any other individual. Kiewit Bridge & Marine expects all of its employees to work in a manner so that they can perform their duties in a safe and productive manner.

Reporting

An employee who witnesses an incident of violence or threatening language or conduct must report the incident to his or her supervisor or Human Resources promptly.

Kiewit Bridge & Marine has no tolerance for retaliation for those who witness, report or take part in an investigation.

Discipline

An employee who violates this policy by engaging in violent conduct or bringing a weapon into the work place is subject to discipline up to and including immediate termination.
SECTION 2.43 USE OF MULTIPLE HOIST LINES ON LIFT CRANES

Lift cranes may be reeved with multiple hoist lines under the following conditions:

1. The current operation requires multiple hoist lines and the hazards have been addressed and reviewed through a JHA.

2. Crane operations will require the use of multiple hoist lines within the next 48 hours.

For example, two lines are acceptable if you physically need them for operations such as excavation, pile driving, tripping rebar cages, etc. It is not acceptable to have a crane reeved with multiple lines simply because the whip line is faster for smaller picks.

If multiple hoist lines are not needed for current operations or within the next 48 hours, the crane must be reduced to a single hoist line. All unused hoist lines will be de-reeved and the wire spooled back on to their corresponding drum.
SECTION 2.44       BENZENE AWARENESS PROGRAM

Physical and Chemical Characteristics

Benzene is a clear, colorless liquid with a distinctive sweet odor. Its boiling point is 176 degrees F and its flash point is 12 degrees F. The flammable limits in air are 1.3% for the low end and 7.5% for the high end. Benzene is a flammable liquid. Its vapors can form explosive mixtures. All ignition sources must be controlled when Benzene is used, handled, or stored. Where liquid or vapor may be released, such areas shall be considered as hazardous locations.

Benzene vapors are heavier than air; thus the vapors may travel along the ground and be ignited by open flames or sparks at locations remote from the site at which Benzene is handled. No smoking in the area where Benzene is used or stored, and fire extinguishers must be readily available.

Benzene is classified as a 1 B flammable liquid for the purpose of conforming to the requirements of 29 CFR 1910.106. A concentration exceeding 3,250 ppm is considered a potential fire explosion hazard. Locations where Benzene may be present in quantities sufficient to produce explosive or ignitable mixtures are considered Class I Group D for the purposes of conforming to the requirements of 29 CFR 1910.309.

Exposure and Health Effects

Benzene is primarily an inhalation hazard. Systemic absorption may cause depression of the hematopoietic system, pancytopenia, aplastic anemia, and leukemia. Inhalation of high concentrations can affect central nervous system function. Aspiration of small amounts of liquid Benzene immediately causes pulmonary edema and hemorrhage of pulmonary tissue. There is some absorption through the skin. Absorption may be more rapid in the case of abraded skin, and Benzene may be more readily absorbed if it is present in a mixture or as a contaminant in solvents that are readily absorbed. The defatting action of Benzene may produce primary irritation due to repeated or prolonged contact with the skin. A high concentration is irritating to the eyes and the mucous membranes of the nose, and respiratory tract.

Direct skin contact with Benzene may cause erythema. Repeated or prolonged contact may result in drying, scaling dermatitis, or development of secondary skin infections. In addition, there is Benzene absorption through the skin. Local effects of Benzene vapor or liquid on the eye are slight. Only at very high concentrations is there any smarting sensation in the eye. Inhalation of high concentrations of Benzene may have an initial stimulatory effect on the central nervous system characterized by exhilaration, nervous excitation, and/or giddiness, followed by a period of depression, drowsiness, or fatigue. A sensation of tightness in the chest accompanied by breathlessness may occur and ultimately the victim may lose consciousness. Tremors, convulsions and death may follow from respiratory paralysis or circulatory collapse in a few minutes to several hours following severe exposures.

The detrimental effect on the blood-forming system of prolonged exposure hematopoietic system is the chief target for Benzene's toxic effects that are manifested by alterations in the levels of formed elements in the peripheral blood. These effects have occurred at concentrations of Benzene that may not cause irritation of mucous membranes, or any unpleasant sensory effects. Early signs and symptoms of Benzene morbidity are varied, often not readily noticed and non-specific. Subjective complaints of headache, dizziness, and loss of appetite may precede or follow clinical signs. Rapid pulse and low blood pressure, in addition to a physical appearance of anemia, may accompany a subjective complaint of shortness of breath and excessive tiredness. Bleeding from the nose, gums, or mucous membranes, and the development of purpuric spots (small bruises) may occur as the
condition progresses. Clinical evidence of leukopenia, anemia, and thrombocytopenia, singly or in combination, has been frequently reported among the first signs.

Bone marrow may appear normal, aplastic, or hyperplastic, and may not, in all situations, correlate with peripheral blood forming tissues. Because of variations in the susceptibility to Benzene morbidity, there is no "typical" blood picture. The onset of effects of prolonged Benzene exposure may be delayed for many months or years after the actual exposure has ceased and identification or correlation with Benzene exposure must be sought out in the occupational history.

Locations were Benzene exposure can occur:

- Petroleum refining sites.
- Tank Gauging (tanks at producing, pipeline and refining operations).
- Field maintenance.

**Regulatory Limits**

The permissible exposure limits for Benzene are as follows:

- **Airborne:** The maximum time-weighted average (TWA) exposure limit is 1 part of Benzene vapor per million parts of air (1 ppm) for an 8-hour workday and the maximum short-term exposure limit (STEL) is 5 ppm for any 15-minute period.

- **Dermal:** Eye and skin contact shall be prevented.

**Working Safely With Benzene**

- Order only the amount needed for your work. Excessive chemicals produce increased risk to the work place.
- Store Benzene in a vented flammable storage cabinet, and have fire extinguishers readily available.
- Before you are about to use Benzene, put on proper personal protective equipment.
- Respiratory, eye and face, boots, gloves and apron protection.
- Smoking is prohibited in areas where Benzene is used and stored.

**Emergency Procedures**

- In a medical emergency call 911 or on site responders (if available). All personnel will be aware of the site specific emergency plan.

- **Inhalation:** If inhaled, move to fresh air. If not breathing give artificial respiration. If breathing difficultly, give oxygen.

- **Skin Contact:** In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes.

- **Eye Contact:** If in contact with eyes, flush with large amounts of water for at least 15 minutes. Assure adequate flushing by separating eyelids with fingers.

- **Ingestion:** If swallowed, wash out mouth with water.
Site Specific Emergency Plan

All projects that are working in the vicinity of Benzene will develop an emergency plan and train employees on the plan.

If after reading this program, you find that improvements can be made, please contact the District Safety Manager. We encourage all suggestions because we are committed to the success of our written Benzene Awareness Program. We strive for clear understanding, safe behavior, and involvement from every level of the company.
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SECTION 2.47 KNIFE POLICY

The use of knives on our projects is generally not recommended and is discouraged. However, we realize in some cases a proper knife may be the appropriate tool for the job. We should always evaluate whether another tool can be used instead of a knife (see below).

Minimum Requirements

- All knives should be high quality, durable, heavy duty and have a locking blade.
- Utility knives must have a single sided blade and be able to retract when not in use.
- The best choice is an automatic self retracting knife (pictured below).
- Before a knife can be used for any operation it must first be included in the Job Hazard Analysis.
- Knives must always be stored with the blade retracted, folded or otherwise protected.
- Only knives with sharp blades will be used.
- Cut resistant gloves are mandatory for operations with repetitive knife use.
- Always keep hands and body away from the path of the cut.
- Fixed knives must be kept in a sheath and secured against accidental removal.

Allowable Knife Types

The preferred type is a self retracting blade utility knife. Utility knives must be able to retract. Pocket knives or multi-tool knives must have a locking blade and be stored where the blade cannot be accidentally engaged.

Suggested Glove Types

Dyneema Cut Resistant Glove Example

Kevlar Cut Resistant Glove and Sleeve Examples
Better Tools for Cutting

- Pencil Sharpeners
- Wire Stripper
- Chamfer Cutter
- Plastic – Visqueen Cutter
- PVC Cutter
SECTION 2.48 NAIL GUN POLICY

Nail guns pose a significant risk when used improperly. It is the policy of Kiewit Bridge & Marine to restrict the use of nail guns to the following guidelines:

- Nail gun operations need to be authorized by the Job Superintendent.

- Operators of nail guns need to be trained in the proper use and the Job Superintendent must sign off on each person who is allowed to use the nail gun.

- Operators will:
  - Review this policy.
  - Be trained by a qualified person in the safe inspection, operation, maintenance and Personal Protective Equipment (PPE). The training content shall be documented.
  - A specific Job Hazard Analysis (JHA) shall be developed covering inspection, operation, maintenance and PPE.

- Nail guns are not to be used on toenailing (nailing at angles) due to the risk of nails deflecting. It is permissible to used smaller nail guns to attach chamfer.

- Fab operations should use templates and jibs to eliminate the need for the operator to hold the board being nailed.

- The area around the nail gun must be restricted to authorized workers to eliminate errant nails from striking people passing through or working close by.

- Nail guns must be de-energized, air or gas drained off before performing any maintenance. If nail guns are battery operated, the battery must be removed.

- Only sequential nail guns are to be used, not bump or contact nail guns.

- The sequential type trigger requires the nose piece to be placed firmly on the work piece before the manual trigger is pulled for a nail to be discharged from the gun. This type of trigger makes unintentional nail discharge less likely.

- Nail guns may not be modified in any way.
SECTION 2.49  RECPROCATING SAW POLICY

There are several different manufacturers of reciprocating saws. Some of the suppliers have an opening on the shaft where the blade connects creating a pinch point hazard for our people. It is the policy of Kiewit Bridge & Marine to use reciprocating saws without this opening.

An example of the tool that has the pinch point is the older Milwaukee Sawzall:

An example of the recommended tool is the Dewalt Model #DW304 or a Milwaukee Sawzall with the protective boot replacement.

Shroud Cover Boot available on newer models. Replacement Boots available for older models through Milwaukee.
SECTION 2.50 ROTOHAMMERS

Hammer drills pose a significant risk to our employees when they bind up and spin uncontrollably. We have experienced too many incidents when this happens. It is the policy of Kiewit Bridge & Marine to only use rotohammers that have an automatic torque control or clutch system that prevents this accidental spin up of the tool. Additionally, the extra handle on the tool is required to be used.

The Hilti ATC drill is the recommended product for rotohammers.