

**INSTRUCTIONS FOR THE PREPARATION OF CRANE
INFORMATION FORM FOR OVERHEAD ELECTRIC
TRAVELING (OET) CRANE(S)**

(NCC Form 08-001, December 2007)

Section 1. Enter the appropriate points of contact's names, activity, email, and phone numbers.

Section 2.

2A. Enter the activity where the cranes will be installed. (UIC = Unit Identification Code, or DODAAC = Department of Defense Activity Address Code for non-Navy installations)

2B. Enter the information for the building location where the cranes will be located.

2C. Enter desired date for the crane to be installed and operational.

Section 3.

3A. Enter crane main hoist capacity in pounds. *As a rule of thumb, the main hoist should be sized such that the heaviest anticipated lift is at 80% of main hoist capacity. This will minimize the number of critical lifts (see NAVFAC P-307 10.4.1).*

3B. Indicate if an auxiliary hoist is necessary and if necessary enter the capacity in pounds. *An auxiliary hoist has a lower lifting capacity (typically from 10 percent to 30 percent of the main hoist) but is correspondingly faster. In normal service it is the auxiliary hoist that is used for most lifts since the need for the rated capacity of the main hoist is infrequent. An auxiliary hoist is not typically included for cranes below 15T capacity.*

3C. Indicate if more than one trolley is required on the same bridge, if required enter the capacity for each trolley. *Multiple trolleys on the same bridge are used for manipulation of lifted loads, or for lifts using equalizing beams in low headroom installation.*

3D. Indicate if there are any cranes on the same runway as the crane to be installed or if there any plans to remove or add additional cranes in the future.

Section 4. Indicate the number if identical cranes required. *If additional cranes are needed that are not identical a separate crane information form should be prepared.*

Section 5.

5A. Indicate if the crane will be General Purpose Service (GPS) or Special Purpose Service (SPS). *Cranes in "special purpose service" (SPS) support*

various lifting operations associated with the servicing of nuclear reactors and related components aboard vessels and in shore facilities. Any crane not designated as an SPS crane is a GPS crane.

5B. Indicate the CMAA #70 class of service for the cranes, if the CMAA class is unknown indicate the estimated main hoist lifts. *Navy Crane Center policy is to require all overhead electric traveling cranes to be a CMAA #70 Class "C" or better.*

5C. Provide information on the lifting operations that the crane will be performing. *This includes a brief description of the normal day to day operation that the crane will perform and any anticipated specialized lifts that the crane may make. Be as specific as possible about what item will be lifted, how high, how far it will be carried, and how often the lift will be performed.*

5D-1. Enter any classification that may be applicable to the cranes. *A hazardous environment is defined as an environment where fire or explosion hazards exist due to presence of flammable vapors, liquids, gases, dusts, or fibers in combustible or flammable concentrations.*

5D-2. If the crane is classified as Hazardous, provide the National Electric Code (NEC) Class, Division and Group, if known. Additionally, identify if the crane will be performing either Hot (Molten) Metal Service or Ordinance/Explosive Handling Service.

- *Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. Class II locations are those that are hazardous because of the presence of combustible dust. Class III locations are those that are hazardous because of the presence of easily ignitable fibers or flyings, but in which such fibers are not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures.*
- *Division 1 is usually when hazardous material is present during normal operating conditions. Division 2 is usually when an abnormal condition would cause a hazardous material to be present.*
- *The NEC Group is based on the chemical properties of the hazardous materials present.*
- *See NEC Code Article 500 for further guidance on hazardous locations.*
- *Hot Metal Service and Ordinance/Explosive Handling service are specialized hazardous environments which require additional safety requirements in the design of cranes.*

5D-3. Indicate if captivation is required and provide a brief explanation of the requirements for the captivation. *Captivation is necessary on fasteners or other material where foreign material exclusion areas prevent these materials. Typically captivation provisions are necessary when cranes are used to lift radioactive materials or major reactor components over open reactor components.*

5D-4. Indicate if containment or oil/grease tight gear is required and provide a brief explanation of the requirements. *Containment or use of oil/grease tight gear is usually required where foreign material exclusion areas prevent these materials, however, other areas exist where dripping grease or oil will create hazards or impact the work area requiring drip pans.*

5D-5. Indicate if the crane operating area is indoors, even if not climate controlled, or outdoors where wind or weather become design factors.

5D-6. Indicate the high and low ambient temperature range where the crane will be operating. *It is important to accurately determine the operating temperature range of the crane to determine appropriate derating factors. Temperatures below 14 degrees F and above 104 degrees F may require additional heating or cooling for panels containing electronic crane drives.*

5D-7. Indicate any additional considerations about the crane's operating environment that may be helpful in crane design.

Section 6.

6A-1. Indicate what the primary mode of operation for the crane.

- *The standard location for controls on an overhead electric traveling crane are in an operator's cab, on a suspended pendant pushbutton station near the floor level, or at a radio controlled remote control station.*
- *Infrared controls are a means of controlling a crane from a remote control station, but are not as common as radio controls due to the fact that the controls will not work when the transmitter is directed away from the crane or is not in line of sight.*
- *Wall controls are uncommon and are usually only used in specialized situations.*

6A-2. Indicate if secondary controls are required and if so indicate the type required. Secondary controls are useful if the operator's position changes frequently from floor level to an elevated platform.

6B-1. If pendant controls were selected in 6A, indicate which options are required for the pendant controls.

- *Lockable pendants will have a keyswitch which will allow the crane to be locked out from the pendant station.*
- *A detachable pendant is usually used when the pendant controls are a secondary mode of operation. This allows the pendant to be completely detached from the crane when the pendant is not being used.*
- *A retractable pendant allows the pendant to retract out of the way when not in use.*
- *Indicator lights such as power on, power available, and fault indications can be located on the pendant. These lights may be located on the pendant, on the crane bridge (See Section 8E.), or in both locations. Location of these lights*

on the pendant make the pendant controller bulkier and require a bigger pendant cable, but may require less maintenance than indicator lights mounted on the bridge.

6B-2. If pendant controls were selected in 6A, indicate how the pendant controls will move. *Standard design is to have the pendant move on it's own independent messenger track. A pendant control mounted from the trolley moves as the trolley of the crane moves requiring the operator to move with the load.*

6C-1. If radio controls were selected in 6A, indicate which type of controls would be preferred for the radio controls. *Joystick type radio controls are the standard design and are similar to cab operated cranes, this method of radio controls usually requires a bigger transmitter and a harness. Pushbutton type radio controls are similar to a pendant station; this method of radio controls reduces the amount of functions that can be placed on the transmitter but provides a lighter transmitter.*

6C-2. If radio controls were selected in 6A, indicate the frequency range for the radio controls (if known).

- *Most activities choose a licensed portable transmitter since it is less susceptible to interference. The range of licensed portable transmitters operating on Government exclusive and Government shared frequencies is less than 1000 feet. For licensed radio control systems, Form DD1494, "Application for Equipment Frequency Allocation" must be approved by the Naval Electromagnetic Spectrum Center (NAVEMSCEN), prior to obtaining a specific frequency from the frequency coordinator.*
- *Some activities choose a non-licensed portable transmitter due to time constraints in obtaining a license and the dearth of frequencies available in the Government exclusive bands. The range of non-licensed portable transmitters operating in non-Government exclusive frequencies is at least 200 feet. Form DD1494, frequency allocation and assignments for non-licensed systems must be submitted to NAVEMSCEN for information.*

6D-1. If cab controls were selected in 6A, indicate the location of the cab controls. *Controls in a cab can either be located on the operator's chair on both sides of the operator or in a separate console in front of the operator. The standard design for AC controlled cranes is for the controls to be located on the operator's chair.*

6D-2. If cab controls were selected in 6A, indicate the cab design that is required. *A skeleton cab has no hard wired controls located in the cab and is only used as a place for the operator to use radio controls.*

6D-3. If cab controls were selected in 6A, indicate any climate control that may be necessary in the operator's cab.

6D-4. If cab controls were selected in 6A, indicate where the operator will be accessing the crane. *The point of access to the crane will be determined by*

whether the operator will be accessing the cab from a service platform on the building or from the crane walkway.

6E. Indicate any additional crane control considerations that may be helpful in crane design such as existing building platforms, building interferences, or unusual operating positions.

Section 7.

7A. Indicate the max and min speeds, in feet per minute, of the Bridge, Trolley, Main Hoist and Auxiliary Hoist, in the corresponding blanks.

- *Maximum speeds should be based on crane capacity, mode of crane operation (floor or cab), bridge and trolley spans, and the type of crane operations that will be performed. Below is a guide for selecting maximum speed in feet per minute based on the Crane Manufacturer’s Association of America (CMAA) #70 specifications. Further guidance on speed selection may be gotten from CMAA #70 or by contacting the Navy Crane Center.*

Guidance for Speeds in Feet Per Minute (fpm)

Crane Capacity	Hoist (Cab or Floor Operated)			Trolley (Cab Operated)			Bridge (Cab Operated)		
	Slow	Medium	Fast	Slow	Medium	Fast	Slow	Medium	Fast
Less than 40,000 lbs	10-14	17-35	30-45	125	150	200	200	300	400
40,000 lbs – 80,000 lbs	5-8	11-17	20-30	100	125	150-175	150	250	350
Greater than 100,000 lbs	3-5	6-9	11-18	30-75	75-126	100-150	50-100	75-200	100-300

Crane Capacity	Trolley (Floor Operated)			Bridge (Floor Operated)		
	Slow	Medium	Fast	Slow	Medium	Fast
Less than 70,000 lbs	50	80	125	50	115	150-175
70,000 lbs – 150,000 lbs	40	70	100	30-40	75-100	125-150
Greater than 150,000 lbs	25-30	60	80	25	50	100

(Note: Fast walk speeds are approximately 75 fpm.)

- *Minimum crane speeds should be selected based on the type of crane operations being performed. Minimum speeds at a ratio greater than 100:1 of the maximum speed on the bridge and trolley function require multiple VFD drives and become a much more complex control system. Default minimum speeds for normal operations are on a ratio of 50:1 of the maximum speeds (Example: If the maximum speed is 100 fpm, the minimum speed would be 2 fpm).*

7B. Indicate if a slow speed selector switch is required for precise positioning. The slow speed selector switch will normally reduce maximum speeds on all functions to 10% of the rated maximum speeds while the slow speed selector switch is on.

Section 8.

8A-1. Indicate who will be supplying the crane runway conductors. Typically, the runway conductors are existing or will be provided by the crane contractor as part of the crane contract.

8A-2. Provide information for the crane runway conductors if they are not going to be installed by the crane contractor.

8A-3. Indicate the voltage and current of the crane supply branch circuit. *Standard AC voltages for crane supplies are most always 480 volts. The rating of the fuses or circuit breaker feeding the crane runway conductors can be used as the supply current. If the crane runway overcurrent device has not been specified or will be provided as part of the crane contract, provide the VA rating of the transformer feeding the crane runway in order to determine the available current, contact NAVCRANECEN if further assistance is needed in determining the branch circuit ratings.*

8A-4. Describe the location of the existing electrical disconnect or circuit breaker with respect to the crane runway. *This can be done by providing a side of the runway (North, South, East, West) and an approximate location on the runway rail (For example: Disconnect is in the northeast corner approximately 30 ft. from the north wall)*

8B. Indicate the type of electrical controls desired for each of the crane's function.

- *Inverter controls is by far the most common type of controls for new crane installations and recommended by NAVCRANECEN. Inverter controls provide less maintenance and better precision than other control types. Infinitely variable inverter controls provide infinite speed points, this can be accomplished either by a control lever or by pushbuttons. Inverter controls that use speed points limit the number of different speeds available by the number of speed points selected.*
- *Two speed controls requires single or two speed squirrel cage motors controlled by contactors. Two speed controls requires more maintenance and provide less precision than inverter controls, but do not use any electronic based controls.*
- *If DC load sensitive, DC fixed speed points, or wound rotor motor control is required indicate type and select Other. These are not standard controls for new OET crane installations.*

8C-1. If inverter controls with speed points was selected in 8B, indicate the number of speed points for each function. *Typically, there will be two to five speed points for each function. For push button controls, the more speed points the longer the push buttons.*

8C-2. Indicate if an hour meter is required. *An hour meter is strongly recommended and will track the amount a time a function has been run. An hour meter is necessary if certain maintenance functions are based on usage and not periodicity.*

8C-3. Indicate if a data logger is required to record faults. *A data logger will record a predetermined amount of run commands, alarms, and faults such that they could be used at a future time to assist in troubleshooting.*

8D. Indicate if Electromagnetic Interference (EMI) suppression is required based on the crane's operating area. *Electromagnetic interference (or EMI, also called radio frequency interference or RFI) is a (usually undesirable) disturbance caused in a radio receiver or other electrical circuit by electromagnetic radiation emitted from an external source. If significant radio frequency generation occurs in the area of the crane, this may be required for electronic crane controls.*

8E. Indicate if indicator lights should be located on the bridge. *Indicator lights such as power on, power available, and fault indications should be located on the bridge if they are not located on the pendant controller. Lights may be located at both the operator's station and the bridge. See section 6B-1 for additional information of location of indicator lights.*

Section 9.

9A-1. Indicate the level of overload protection necessary to prevent overloading the crane's capacity. *NAVCRANECEN recommends an overload lockout, which will not allow the operator to lift a weight in excess of the crane's capacity. Typically overload lockouts are bypassable by a switch to allow for load testing of the crane. An overload warning will not lockout the crane when an overload of the crane's capacity is experienced, but will notify the operator by a warning device.*

9A-2. If an overload warning or lockout was selected in 9A-1 indicate the percentage of full capacity where the overload protection should be set. *NAVCRANECEN recommends setting the overload protection at 100% of capacity or less, if the overload protection is by means of a lockout this will prevent an overload accident as defined by the NAVFAC P-307, but may activate with as little as 80% capacity load on the hoist due to acceleration forces.*

9B. Indicate if anti-collision interlocks are required. *Anti-collision interlocks are used to slow down or stop a crane before colliding with another crane or object. Typically they require a transmitter to be placed on the crane and a reflective target to be placed on the crane or object that the crane could come into contact with. Bumpers, which are a standard item mounted on the bridge and trolley, are typically sufficient except for sensitive loads.*

9C. Indicate which warning devices are required. *At least one of the warning devices listed is required for all cab operated or remote controls cranes. More than one device can be selected. NAVCRANECEN recommends having at least one warning device on all OET cranes.*

9D. Indicate if travel limits are required. *Travel limits are used to stop or slow down either the trolley or bridge function at a certain point on the rail. Travel limits are not used on typical OET crane installations.*

9E. Indicate if a load moment indicator is required. *Load Moment Indicators (LMIs) provide a continuous visual display of the lifted load on the crane. LMIs are usually located either in an operator's cab or on the bridge of the crane where they can be seen from the ground. In some cases, they can be displayed on the pendant control or radio control.*

9F. Indicate the location of walkways on the crane. *Current NAVCRANECEN policy for new cranes equipped with footwalks, is to require a full-length footwalk on each girder and a crossover footwalk across an end tie or trolley. For low overhead cranes where maintenance will only be performed from a lift, footwalks may be omitted.*

Section 10.

10A-1. Indicate if floodlights are required to illuminate the work space beneath the crane. *On OET cranes, floodlights are mounted along the bridge to illuminate the floor area beneath the crane. The floodlights are spaced to match the building's lighting fixture arrangement so as to compensate for the shadow cast by the crane.*

10A-2. Indicate if there is a preference in the type of floodlight and if so indicate the type preferred. *Metal halide or tungsten halogen (quartz) lamps are recommended by NAVCRANECEN to be used in floodlights and spotlights. Floodlights should match the building ambient lighting as much as possible to avoid changes in light intensity or color as the crane passes.*

10B. Indicate if there is any special paint requirements, such as primer only, and provide a brief explanation.

10C. Indicate if the government or the crane contractor will provide the test weights and rigging gear for the acceptance of the crane. *Crane contractors can provide rigging gear and test weights, but activities should try to provide these services if possible to reduce the price of the crane contract and to ensure that sufficient weight is available locally to support periodic load testing.*

10D. Indicate how many hard copies of manuals and drawings are required. *Cranes will be supplied with electronic copies of all drawings and manuals.*

10E. Indicate if training for the crane is required. *Typically operational and maintenance training for the crane is provided as part of the contract, but there are instances where training is not needed as thus could reduce the price of the contract.*

10F. Provide any additional information or expand on any answers previously given that would be beneficial in developing the specifications for the crane.

INSTRUCTIONS FOR THE PREPARATION OF OVER HEAD CRANE WORKSHEETS

(NCC Form 08-001, December 2007)

The Over Head Crane Clearance Worksheet and the Over Head Crane Building Worksheet provide supplemental information for the NCC Crane Information Form for Over Head Electric Traveling Crane.

Mandatory information that requires value input shall be marked with (M) designation in this instruction.

Conditionally mandatory information that requires value input contingent on other feature(s) of the crane or the building are marked with (CM) designation.

Supporting information fields are optional, and they are to be filled with readily available information.

Turn on the "Highlight Field" feature of Adobe Acrobat when filling the sketch form electronically to identify all fields.

A. OVER HEAD CRANE CLEARANCE WORKSHEET

Compass Direction

Indicate the compass direction associated with the plan view of the crane. *When the actual location of the building falls between two directions, select the direction preferred for labeling of the crane controls. Select only the upward direction when filling electronically; the other directions are filled automatically.*

Plan View

Cab/No Cab: Select an operator's cab location at one corner of the crane figure. *If the crane does not or will not have a cab, select "No Cab" option. (M)*

Walkway: Select all the walkway on girders and end trucks where it is desired. *Walkways are desirable where maintenance personnel will need access to crane components. Leave all blank if no walkway is required. (M)*

Girder A/Girder B: Select "Drive", "Idler", or "Any" for "Girder A". "Girder B" designation will be filled automatically when filling form electronically. *Leave blank or select "Any" for "Girder A" if no preference. (M)*

Elevation/View X-X

1. **A:** Distance between the centerlines of the crane runway rails. *Enter value in feet-inches. (M)*
2. **B:** Distance from the operating floor to the saddle of the main hook when it is at the highest point. *This value is required when a minimum hook height is needed for a particular lift or building obstructions. Enter value in feet-inches or round up to the next 1 foot. (CM)*
3. **C:** Distance from the top of the crane rail to the lowest obstruction in the building such as roof truss, lights, sprinklers, etc. *Enter value in feet-inches. (M)*
4. **D:** Distance from the operating floor to the top of the crane rail. *Enter value in feet-inches. (M)*
5. **E and F:** The maximum distance from center of the saddle of the **main** hook to the centerline of the crane runway rail when the trolley parks against the stops. *This will*

determine how close the crane hook can approach the building walls. Enter value in “feet-inches”. (M)

6. **G:** Distance between the centers of the saddle of main hook and auxiliary hook. *Dimension G is required when the distance from the center of the auxiliary hook to a centerline of the runway is critical such as for two-hook lifts. (CM)*
7. **H:** The height reference for the pendant push button station. Value for H is relevant for crane with pendant control push button only. *The typical dimension is four feet. Enter value in feet.*
8. **J and I:** Values for J and I are pre-filled. *They are the minimum OSHA requirement for top and side clearances respectively from crane structure to building stationary objects.*
9. **K:** Measurement from the centerline of crane runway rail to the first obstruction on the side of the building. *Value for K can be used to determine the overall length of the crane while maintaining minimum requirement of dimension I. This is mandatory for existing structures. Provide only the smallest value for K if available. (CM)*
10. **L:** Runway rail size in ASCE lbs/yard unit. *This is mandatory for existing structures. (CM)*
11. **M, N, and O:** When permanent obstruction exist within crane operating envelope, values for dimension M, N, O are required. (CM)
12. **P:** If a pit exists within the crane service area and crane operation requires the hook to be lowered in to a pit then a value for dimension P is required. (CM)
13. **Q:** Enter values Q for existing crane.
14. **U and T:** Enter these values if the existing crane is an eight-wheel crane.
15. **S:** Enter value for S when for the case of two existing cranes share the same runway.
16. **R and V:** These are the wheel loads used for design of runway girders, excluding impact. *Enter value for R or V or both as applicable. Include source for data.*
17. **Notes:** Provide note(s) for clarification or additional information.

B. OVER HEAD CRANE BUILDING WORKSHEET

Compass Direction

Indicate the compass direction identical to that on sketch A-1. *Select only the upward direction when filling electronically; the other directions are filled automatically.*

Plan View

1. **Main Power Disconnect:** Select the approximate location for the main power disconnect to the crane.
2. **Crane Access Ladder:** Indicate the side of the building which has a crane access ladder. *If no ladder or no information available, select “----”*
3. **AA:** Enter the value for crane runway length in feet. *This value is mandatory for new crane when contractor has to supply the runway conductor system. (M)*
4. **BB, CC and DD:** Enter the desired values in feet-inches for crane hooks approach from the ends of the runway when crane parks against its stops. *These values define how close the hook can approach the ends of the building.*

5. **EE:** Enter the appropriate value for EE when the crane main power disconnect is located significantly away from the end of the runway.
6. **FF and GG:** When permanent obstruction exists within crane operating envelope, dimensions FF and GG are required. **(CM)**
7. Enter all information under “Crane Electrification” **(M)**
8. Enter all available information for “Existing Runway Conductor Configuration” if the runway conductors will be reused.
9. **Notes:** Provide note(s) for clarification or additional information.