



Duke University - Facilities Management Department

Standard Operating Procedure

Crane Risk Mitigation

Applicable to: All Duke Organizations and Contractors

Date Effective: January 1, 2023

Issue No.: 1 Revision: 1

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❖ Purpose

- The Crane Setup Program is designed to provide a consistent safe procedure for crane set-up and ensure underground utilities and hardscape/landscape are not damaged during ANY kind of crane setup procedure.
- The Facilities Management Department (FMD) program should be used in conjunction with any/all Duke University policies and procedures pertaining to crane setup and provides specific procedures and responsibilities for FMD employees and contractors.

❖ Scope

- This program applies to all Duke employees and contractors working on Duke property.
- This policy applies to all crane setup on campus. **This policy does NOT apply to boom trucks (boom trucks do not have counterweights).**

❖ Policy

- FMD will take all reasonable measures to provide a safe workplace. All FMD operations must be performed in a manner, which will prevent any undesirable effects to FMD and/or Duke employees, assets, the local community, and the environment.
- The provisions of this program and all applicable standards will be followed to ensure the reliable operation of utility systems. Failure to follow the requirements of the Crane Setup Program will be cause for disciplinary action for Duke employees and potential fines & penalties for contractors.
- Duke's Crane Setup Program is meant to work with all federal and state regulatory requirements including OSHA 29 CFR 1926.

❖ Procedures

- All crane set ups require review and approval through Risk Mitigation Committee. FMD crane review procedure is focused on the overall protection of utilities and does not relieve any liability, responsibility or take place of any Code, State or Federal requirement of the contractor.
- Project Managers must follow Duke Utilities Risk Mitigation Program for scheduling with the Risk Mitigation Committee.
- A site specific survey must be performed. The project survey may be used as the site specific survey; however if crane setup is planned over existing utilities, then subsurface information may be required for existing depths of all utilities. This only applies to utilities that are subject to additional loads during crane operation.
- Crane set up plan shall be provided. This plan shall include the location of the crane set up and the locations of the outriggers. Accurate locations shall be determined using 811 Locating Service for existing utilities. This is critical for review and set up of the crane operation. Crane shall be set up at a minimum of 1:1 ratio from edge of existing utilities, without DUES pre-approval.
- Crane operators loading calculations and diagrams of load weights and capacity charts. This should include the reaction forces at the outriggers. These calculations must be provided in PSF to the Risk Mitigation team for review. **Risk Mitigation team requires point load of utilities/hardscape to be below 1500 PSF for approval.**
- A soil report may be requested by the Risk Mitigation team to ensure that adequate foundations have been prepared for the crane. The goal of the soils report is to demonstrate that the outrigger pads are large enough to prevent settlement of soil. If settlement is anticipate, then an appropriate foundation will be designed by a qualified professional to accommodate the crane during operation.
- A utility loading report may be requested with the crane set up plan. The utility loading report shall include an analysis of all utilities/vaults/tunnels within the zone of influence of the applied loads. The analysis shall include



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the added vertical and horizontal loading to underground structures and utilities. The analysis shall also include a profile at each outrigger and significant point loads along the utilities. The report shall also include allowable pipe loading analysis and impacts of the additional loading with an equivalent soil overburden.

❖ **Training**

- Duke managers, supervisors and project managers will be responsible for training their employees and contractors.

❖ **References**

- FMD Risk Mitigation Program

❖ **Document Retention**

- Signed Risk (Crane) Mitigation form must remain on the work site and made available to any Duke employee requesting to review the form.
- Forms may be discarded after work is complete.

❖ **Attachments**

- ***Documents can be found on Facilities Management Department website under Design and Construction/ Contractors and Consultants/Excavation Program.***

<https://facilities.duke.edu/construction/contractors/excavation>