

APPENDIX C
SAMPLE SAFETY AUDIT

SAMPLE SAFETY AUDIT

A. ORGANIZATION & ADMINISTRATION

| <u>Activity</u> | <u>Poor</u> | <u>Fair</u> | <u>Good</u> | <u>Excellent</u> |
|---|---|---|--|---|
| 1. Statement of policy, responsibilities assigned | No statement of Loss Control Policy. Responsibility & accountability not assigned | A general understanding of Loss Control, responsibilities & accountability, but not written | Loss Control Policy & responsibilities written & distributed to supervisors. | In addition to "Good" Loss Control Policy is reviewed annually & is posted. Responsibility & accountability is emphasized in supervisory performance evaluations. |
| 2. Safe operating procedures (SOP's) | No written SOP's. | Written SOP's for some, but not all, hazardous operations | Written SOP's for all hazardous operations. | All hazardous operations covered by a procedure, posted at the job location, with an annual documented review to determine adequacy. |
| 3. Employee selection & placement | Only pre-employment physical examination given | In addition, an aptitude test is administered to new employees. | In addition to "Fair" new employees' past safety record is considered in their employment. | In addition to "Good" when employees are considered for promotion, their safety attitude & record are considered. |
| 4. Emergency & disaster control plans | No plan or procedures | Verbal understanding on emergency procedures | Written plan outlining the minimum requirements. | All types of emergencies covered with written procedures. Responsibilities are defined with backup personnel provisions. |
| 5. Direct management involvement | No measurable activity. | Followup on accident problems | In addition to "Fair," management reviews all injury & property damage reports & holds supervision accountable for verifying firm corrective measures. | In addition to "Good" reviews all investigation reports. Loss Control problems are treated as other operational problems in staff meeting. |

SAMPLE SAFETY AUDIT (Continued)

A. ORGANIZATION & ADMINISTRATION (Continued)

| <u>Activity</u> | <u>Poor</u> | <u>Fair</u> | <u>Good</u> | <u>Excellent</u> |
|-----------------------|-------------------|--|--|--|
| 6. Plant safety rules | No written rules. | Plant safety rules have been developed & posted. | Plant safety rules are incorporated in the plant work rules. | In addition, plant work rules are firmly enforced & updated at least annually. |

B. INDUSTRIAL HAZARD CONTROL

| <u>Activity</u> | <u>Poor</u> | <u>Fair</u> | <u>Good</u> | <u>Excellent</u> |
|--|---|---|---|---|
| 1. Housekeeping-- storage of materials, etc. | Housekeeping is generally poor. Raw materials, items being processed & finished materials are poorly stored. | Housekeeping is fair. Some attempts to adequately store materials are being made. | Housekeeping & storage of materials are orderly. Heavy & bulky objects well stored out of aisles, etc. | Housekeeping & storage of materials are ideally controlled. |
| 2. Machine guarding | Little attempt is made to control hazardous points on machinery. | Partial, but inadequate or ineffective attempts at control are in evidence. | There is evidence of control which meets applicable Federal & State requirements, but improvements may still be made. | Machine hazards are effectively controlled to the extent that injury is unlikely. Safety of operator is given prime consideration at time of process design. |
| 3. General area guarding | Little attempt is made to control such hazards as: unprotected floor openings; slippery or defective floors; stairway surfaces; inadequate illumination, etc. | Partial, but inadequate attempts to control these hazards are evidenced. | There is evidence of control which meets applicable Federal & State requirements-- but further improvement may still be made. | These hazards are effectively controlled to the extent that injury is unlikely. |
| 4. Maintenance of equipment, guards, handtools, etc. | No systematic program of maintaining guards, handtools, controls & other safety features of equipment, etc. | Partial, but inadequate or ineffective maintenance. | Maintenance program for equipment & safety features is adequate. Electrical handtools are tested & inspected before issuance, & on a routine basis. | In addition to "Good" a preventative maintenance system is programmed for hazardous equipment & devices. Safety reports filed & safety department consulted when abnormal conditions are found. |

SAMPLE SAFETY AUDIT (Continued)

B. INDUSTRIAL HAZARD CONTROL(Continued)

| <u>Activity</u> | <u>Poor</u> | <u>Fair</u> | <u>Good</u> | <u>Excellent</u> |
|--|--|---|--|---|
| 5. Materials handling-- hand & mechanized | Little attempt is made to minimize possibility of injury from the handling of materials. | Partial but inadequate or ineffective attempts at control are in evidence. | Loads are limited as to size & shape for handling by hand, & mechanization is provided for heavy or bulky loads. | In addition to controls for both hand & mechanized handling, adequate measures prevail to prevent conflict between other workers & material being moved. |
| 6. Personal protective equipment--adequacy & use | Proper equipment not provided or is not adequate for specific hazards. | Partial but inadequate or ineffective provision, distribution & use of personal protective equipment. | Proper equipment is provided. Equipment identified for special hazards, distribution of equipment is controlled by supervisor. Employee is required to use protective equipment. | Equipment provided complies with standards. Close control maintained by supervision. Use of safety equipment recognized as an employment requirement. Injury record bears this out. |

C. FIRE CONTROL & INDUSTRIAL HYGIENE

| | | | | |
|--|---|---|--|---|
| 1. Chemical hazard control references | No knowledge or use of reference data. | Data available & used by foremen when needed. | In addition to "Fair" additional standards have been requested when necessary. | Data posted & followed where needed. Additional standards have been promulgated, reviewed with employees involved & posted. |
| 2. Flammable & explosive materials control | Storage facilities do not meet fire regulations. Containers do not carry name of contents. Approved dispensing equipment not used. Excessive quantities permitted in manufacturing areas. | Some storage facilities meet minimum fire regulations. Most containers carry name of contents. Some approved dispensing equipment in use. | Storage facilities meet minimum fire regulations. Most containers carry name of contents. Approved equipment generally is used. Supply at work area is limited to one day requirement. Containers are kept in approved storage cabinets. | In addition to "Good" storage facilities exceed the minimum fire regulations & containers are always labeled. A strong policy is in evidence relative to the control of the handling, storage & use of flammable materials. |

SAMPLE SAFETY AUDIT (Continued)

C. FIRE CONTROL & INDUSTRIAL HYGIENE (Continued)

| <u>Activity</u> | <u>Poor</u> | <u>Fair</u> | <u>Good</u> | <u>Excellent</u> |
|--|--|--|--|--|
| 3. Ventilation--fumes, smoke and dust control | Ventilation rates are below industrial hygiene standards in areas where there is an industrial hygiene exposure. | Ventilation rates in exposure areas meet minimum standards. | In addition to "Fair" ventilation rates are periodically measured, recorded & maintained at approved levels. | In addition to "Good" equipment is properly selected & maintained close to maximum efficiency. |
| 4. Skin contamination control | Little attempt at control or elimination of skin irritation exposures. | Partial, but incomplete program for protecting workers. First-aid reports on skin problems are followed up on an individual basis for determination of cause. | The majority of workmen instructed concerning skin-irritating materials. Workmen provided with approved personal protective equipment or devices. Use of this equipment is enforced. | All workmen informed about skin-irritating materials. Workmen in all cases provided with approved personal protective equipment or devices. Use of proper equipment enforced & facilities available for maintenance. Workers are encouraged to wash skin frequently. Injury record indicates good control. |
| 5. Fire control measures | Do not meet minimum insurance or municipal requirements. | Meets minimum requirements. | In addition to "Fair" additional fire hoses &/or extinguishers are provided. Welding permits issued. Extinguishers on all welding carts. | In addition to "Good" a fire crew is organized & trained in emergency procedures & in the use of fire fighting equipment. |
| 6. Waste--trash collection & disposal, air/water pollution | Control measures are inadequate. | Some controls exist for disposal of harmful wastes or trash. Controls exist but are ineffective in methods or procedures of collection & disposal. Further study is necessary. | Most waste disposal problems have been identified & control programs instituted. There is no room for further improvement. | Waste disposal hazards are effectively controlled. Air/water pollution potential is minimal. |

SAMPLE SAFETY AUDIT (Continued)

D. SUPERVISORY PARTICIPATION, MOTIVATION & TRAINING

| <u>Activity</u> | <u>Poor</u> | <u>Fair</u> | <u>Good</u> | <u>Excellent</u> |
|---|--|---|--|---|
| 1. Line supervisor safety training | All supervisors have not received basic safety training. | All shop supervisors have received some safety training. | All supervisors participate in division safety training session a minimum of twice a year. | In addition, specialized sessions conducted on specific problems. |
| 2. Indoctrination of new employees. | No program covering the health & safety job requirements. | Verbal only | A written handout to assist in indoctrination. | A formal indoctrination program to orientate new employees is in effect. |
| 3. Job hazard analysis (JHA). | No written program. | JHA program being implemented on some jobs. | JHA conducted on majority of operations. | In addition, job hazard analyses performed on a regular basis & safety procedures written & posted for all operations. |
| 4. Training for specialized operations (Fork trucks, grinding, press brakes, punch presses, solvent handling, etc.) | Inadequate training given for specialized operations. | An occasional training program given for specialized operations. | Safety training is given for all specialized operations on a regular basis & retraining given periodically to review correct procedures. | In addition to "Good" an evaluation is performed annually to determine training needs. |
| 5. Internal self-inspection. | No written program to identify & evaluate hazardous practices &/or conditions. | Plant relies on outside sources; i.e., Insurance Safety Engineer & assumes each supervisor inspects his area. | A written program outlining inspection guidelines, responsibilities, frequency & follow up is in effect. | Inspection program is measured by results; i.e., reduction in accidents & costs. Inspection results are followed by top management. |
| 6. Safety promotion & publicity. | Bulletin boards & posters are considered the primary means for safety promotion. | Additional safety displays, demonstrations, films, are used infrequently. | Safety displays & demonstrations are used on a regular basis. | Special display cabinets, windows, etc. are provided. Displays are used regularly & are keyed to special themes. |

SAMPLE SAFETY AUDIT (Continued)

D. SUPERVISORY PARTICIPATION, MOTIVATION & TRAINING (Continued)

| <u>Activity</u> | <u>Poor</u> | <u>Fair</u> | <u>Good</u> | <u>Excellent</u> |
|--|---|---|---|--|
| 7. Employee/supervisor safety contact & communication. | Little or no attempt made by supervisor to discuss safety with employees. | Infrequent safety discussions between supervisor & employees. | Supervisors regularly cover safety when reviewing work practices with individual employees. | In addition to items covered under "Good" supervisors make good use of the shop safety plan & regularly review job safety requirements with each worker. They contact at least one employee daily to discuss safe job performance. |

E. ACCIDENT INVESTIGATION, STATISTICS AND REPORTING PROCEDURES

| | | | | |
|--|---|--|--|--|
| 1. Accident investigation by line personnel. | No accident investigation made by line supervision. | Line supervision makes investigations of only medical injuries. | Line supervision trained & makes complete & effective investigations of all accidents; the cause is determined; corrective measures initiated immediately with a completion date firmly established. | In addition to items covered under "Good" investigation is made of every accident within 24 hours of occurrence. Reports are reviewed by the department manager & plant manager. |
| 2. Accident cause & injury location analysis & statistics. | No analysis of disabling & medical cases to identify prevalent causes of accidents & location where they occur. | Effective analysis by both cause & location maintained on medical & first aid cases. | In addition to effective accident analysis, results are used to pinpoint accident causes so accident prevention objectives can be established. | Accident causes & injuries are graphically illustrated to develop the trends & evaluate performance. Management is kept informed on status. |
| 3. Investigation of property damage. | No program. | Verbal requirement or general practice to inquire about property damage accidents. | Written requirement that all property damage accidents of \$50 & more will be investigated. | In addition, management requires a vigorous investigation effort on all property damage accidents. |
| 4. Proper reporting of accidents & contact with carrier. | Accident reporting procedures are inadequate. | Accidents are correctly reported on a timely basis. | In addition to "Fair" accident records are maintained for analysis purposes | In addition to "Good" there is a close liaison with the insurance carrier. |

RATING FORM

| | <u>Poor</u> | <u>Fair</u> | <u>Good</u> | <u>Excellent</u> | <u>Comments</u> |
|---|-------------|-------------|-------------|------------------|--------------------|
| A. ORGANIZATION & ADMINISTRATION | | | | | |
| 1. Statement of policy, responsibilities assigned. | 0 | 5 | 15 | 20 | |
| 2. Safe operating procedures (SOP's). | 0 | 2 | 15 | 17 | |
| 3. Employee selection and placement. | 0 | 2 | 10 | 12 | |
| 4. Emergency and disaster control planning. | 0 | 5 | 15 | 18 | |
| 5. Direct management involvement. | 0 | 10 | 20 | 25 | |
| 6. Plant safety rules. | 0 | 2 | 5 | 8 | |
| Total value of circled numbers | _____ | + _____ | + _____ | + _____ | X .20 Rating _____ |
| B. INDUSTRIAL HAZARD CONTROL | | | | | |
| 1. Housekeeping--storage of materials, etc. | 0 | 4 | 8 | 10 | |
| 2. Machine guarding. | 0 | 5 | 16 | 20 | |
| 3. General area guarding. | 0 | 5 | 16 | 20 | |
| 4. Maintenance of equipment guards, hand tools, etc. | 0 | 5 | 16 | 20 | |
| 5. Material handling--hand and mechanized. | 0 | 3 | 8 | 10 | |
| 6. Personal protective equipment--adequacy and use. | 0 | 7 | 20 | 20 | |
| Total value of circled numbers | _____ | + _____ | + _____ | + _____ | X .20 Rating _____ |
| C. FIRE CONTROL & INDUSTRIAL HYGIENE | | | | | |
| 1. Chemical hazard control references. | 0 | 6 | 17 | 20 | |
| 2. Flammable and explosive materials control. | 0 | 6 | 17 | 20 | |
| 3. Ventilation--fumes, smoke and dust control. | 0 | 2 | 8 | 10 | |
| 4. Skin contamination control. | 0 | 3 | 10 | 15 | |
| 5. Fire control measures. | 0 | 2 | 8 | 10 | |
| 6. Waste--trash collection and disposal, air/water pollution. | 0 | 7 | 20 | 25 | |
| Total value of circled numbers | _____ | + _____ | + _____ | + _____ | X .20 Rating _____ |

Poor Fair Good Excellent Comments

D. SUPERVISORY PARTICIPATION, MOTIVATION & TRAINING

| | | | | |
|---|---|----|----|----|
| 1. Line supervisor safety training. | 0 | 10 | 22 | 25 |
| 2. Indoctrination of new employees. | 0 | 1 | 5 | 10 |
| 3. Job hazard analysis. | 0 | 2 | 8 | 10 |
| 4. Training for specialized operations. | 0 | 2 | 7 | 10 |
| 5. Internal self-inspection. | 0 | 5 | 14 | 15 |
| 6. Safety promotion and publicity. | 0 | 1 | 4 | 5 |
| 7. Employee/supervisor contact and communication. | 0 | 5 | 20 | 25 |

Total value of circled numbers + + + X .20 Rating

E. ACCIDENT INVESTIGATION, STATISTICS & REPORTING PROCEDURES

| | | | | |
|--|---|----|----|----|
| 1. Accident investigation by line supervisor. | 0 | 10 | 32 | 40 |
| 2. Accident cause and injury location analysis and statistics. | 0 | 3 | 8 | 10 |
| 3. Investigation of property damage. | 0 | 10 | 32 | 40 |
| 4. Proper reporting of accidents and contact with carrier. | 0 | 3 | 8 | 10 |

Total value of circled numbers + + + X .20 Rating

SUMMARY

The numerical values below are the weighted ratings calculated on rating sheets. The total becomes the overall score for the location.

- A. Organization & Administration _____
- B. Industrial Hazard Control _____
- C. Fire Control & Industrial Hygiene _____
- D. Supervisory Participation, Motivation & Training _____
- E. Accident Investigation, Statistics & Reporting Procedures _____

TOTAL RATING _____

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APPENDIX D
EXAMPLES OF SAFETY PROGRAM ASSESSMENT FORMS

Accident Investigation Assessment Form

| | Yes | No |
|---|-------|-------|
| 1. Are employees required to report <u>all</u> injuries and property damage incidents? | _____ | _____ |
| 2. Do the accident investigation procedures urge employees to report near miss accidents? | _____ | _____ |
| 3. Are first-line supervisors required to investigate and report minor injury accidents? | _____ | _____ |
| 4. Is a written record made of all accident investigations? | _____ | _____ |
| 5. Does a management level above the first-line supervisor participate in serious injury accidents? | _____ | _____ |
| 6. Are the majority of accidents investigated on the day of the occurrence? | _____ | _____ |
| 7. Have supervisors been trained in techniques of accident investigation? | _____ | _____ |
| 8. Do accident reports clearly identify the cause(s) of the accident? | _____ | _____ |
| 9. Are recommendations for corrective action to prevent recurrence implemented in a timely manner? | _____ | _____ |
| 10. Is someone assigned the responsibility of keeping OSHA records, and are they kept up to date? | _____ | _____ |

Assessment for Control of Hazards Form

| | Yes | No |
|---|-------|-------|
| 1. Is safety and health data readily available to all employees? | _____ | _____ |
| 2. Are material safety data sheets available to supervisors? | _____ | _____ |
| 3. Are safe job procedures and safety rules available to all employees? | _____ | _____ |
| 4. Are routine safety and health inspections conducted? | _____ | _____ |
| 5. Is there a procedure for handling employee safety and health complaints? | _____ | _____ |
| 6. Are noted safety deficiencies promptly corrected? | _____ | _____ |
| 7. Is there an engineering and administrative control program in effect? | _____ | _____ |
| 8. Is management knowledgeable in the selection, care and maintenance of personal protective equipment? | _____ | _____ |
| 9. Are employees instructed in the correct use and care of personal protective equipment? | _____ | _____ |
| 10. Is there a program in effect for good housekeeping and and routine maintenance? | _____ | _____ |

Assessment of Safety Inspection Form

| | Yes | No |
|---|-------|-------|
| 1. Does the safety program provide for periodic safety and health inspections? | _____ | _____ |
| 2. Are individuals assigned responsibility for conducting inspections? | _____ | _____ |
| 3. Do management and employees conduct joint inspections? | _____ | _____ |
| 4. Does management have an abatement program in effect? | _____ | _____ |
| 5. Does the inspection cover materials storage and material handling? | _____ | _____ |
| 6. Does the inspection cover housekeeping in general and particularly for walking and working surfaces? | _____ | _____ |
| 7. Does the inspection cover the use, care and maintenance of personal protective equipment? | _____ | _____ |
| 8. Does the inspection cover access and exit to work areas? | _____ | _____ |
| 9. Does the inspection cover use, care and maintenance of hand tools (powered and unpowered)? | _____ | _____ |
| 10. Does the inspection cover physical and chemical hazards? | _____ | _____ |

Assessment of Safety Training Form

| | Yes | No |
|---|-------|-------|
| 1. Are all new employees given a safety orientation before they start work? | _____ | _____ |
| 2. Are employees, old or new, provided with safety job instruction when assigned to a new job? | _____ | _____ |
| 3. Is the training directed to the specific hazards of the new job? | _____ | _____ |
| 4. Has management identified those persons responsible for training employees? | _____ | _____ |
| 5. Are safety rules and practices periodically discussed with all employees? | _____ | _____ |
| 6. Is a portion of each safety meeting devoted to providing safety instruction for upcoming work? | _____ | _____ |
| 7. Have safety training responsibilities been assigned to someone? | _____ | _____ |
| 8. Are training priorities being assessed? | _____ | _____ |
| 9. Are the training objectives clearly defined? | _____ | _____ |
| 10. Is the training program periodically evaluated? | _____ | _____ |

Assessment of Safety Attitude Form

| | Yes | No |
|---|-------|-------|
| 1. Do supervisors observe stated safety rules and safe job procedures? | _____ | _____ |
| 2. Do employees perceive management as doing a good job at correcting reported unsafe conditions? | _____ | _____ |
| 3. Are employees given the opportunity to take an active role in the safety program? | _____ | _____ |
| 4. Are plant safety rules posted and made available to all employees? | _____ | _____ |
| 5. Are reasons for the safety rules explained to the employees? | _____ | _____ |
| 6. Does management reinforce safe employee behavior? | _____ | _____ |
| 7. Are noncooperative employees reprimanded for infractions of plant safety rules and practices? | _____ | _____ |
| 8. Does management support supervisor efforts to enforce plant safety rules and practices? | _____ | _____ |
| 9. Do employees feel that management is interested and involved in the safety program? | _____ | _____ |
| 10. Does management feel that the employees are interested and involved in the safety program? | _____ | _____ |

Assessment of Safe Work Procedures Form

| | Yes | No |
|---|-------|-------|
| 1. Have accident repeater jobs been identified and analyzed to develop safer procedures? | _____ | _____ |
| 2. Have safe job procedures been standardized for hazardous jobs? | _____ | _____ |
| 3. Are hazardous tasks covered by written safe job procedures? | _____ | _____ |
| 4. Do supervisors develop written safe job procedures? | _____ | _____ |
| 5. Are employees encouraged to participate in development of written safe job procedures? | _____ | _____ |
| 6. Are written safe job procedures prepared prior to initiation of new jobs or tasks? | _____ | _____ |
| 7. Do supervisors periodically observe hazardous jobs or tasks to determine if safe work procedures are being utilized? | _____ | _____ |
| 8. Are hazardous jobs or tasks accomplished the same by all work crews or shifts? | _____ | _____ |
| 9. Are written safe job procedures used to train employees? | _____ | _____ |
| 10. Are written safe job procedures periodically updated for improving work methods? | _____ | _____ |

Assessment of Management's Participation in Safety Form

| | Yes | No |
|--|-------|-------|
| 1. Is the plant safety program a topic on the manager's staff meeting agenda? | _____ | _____ |
| 2. Do middle managers periodically conduct safety meetings with subordinate supervisors? | _____ | _____ |
| 3. Do middle managers conduct safety inspections? | _____ | _____ |
| 4. Does the plant manager review periodic reports of plant accidents? | _____ | _____ |
| 5. Does management promptly correct unsafe conditions? | _____ | _____ |
| 6. Does management encourage employees to report hazardous conditions? | _____ | _____ |
| 7. Does management encourage employee safety suggestions? | _____ | _____ |
| 8. Does the plant have procedures for handling emergencies? | _____ | _____ |
| 9. Do members of management observe the plant's stated safety rules and practices? | _____ | _____ |
| 10. Are all levels of managers held accountable for their safety responsibilities? | _____ | _____ |

Summary

The assessment forms address samples of various questions which may be asked concerning the safety program. The questions presented on the sample forms are not intended to represent the most important to be answered. They are intended to be examples only. Management may desire to find answers to other areas of the safety program which are considered problem areas and should develop an assessment tool which would yield those answers.

Adapted from Evaluation of Safety and Health Program and Operation Zero Accident Prevention Fundamentals [45,47].

GLOSSARY

| | |
|-------------|---|
| aggregate | Hard, inert mineral rock fragments or materials such as sand, gravel, or slag used for mixing with a cementing material to form concrete. Fine aggregate is sand and other finely graded materials. Coarse aggregate is the large material that passes through sieve openings of one-fourth inch or more. |
| bull float | A tool used to spread out and smooth the concrete. |
| bush hammer | An air-powered reciprocating tool used to give a textured appearance to architectural concrete products by roughening the surface. |
| camber | (a) The upward deflection that occurs in prestressed concrete elements due to the net bending resulting from stressing forces and self-weight. It specifically does not include dimensional inaccuracies. (b) A built-in upward curvature in some molds for precast concrete other than prestressed to avoid deflection under load to below a defined line of finished product. |
| cement | Any of various construction adhesives, consisting essentially of powdered, calcined rock and clay materials, that form a paste with water and can be molded or poured to set as a solid mass. |
| concrete | A mixture of cement, sand, and aggregate with water that hardens by chemical curing into a final product similar to stone in texture, weight, and durability. |
| connection | A device for attachment of precast concrete elements to each other or to a building structure. |
| curing | The maintenance of humidity and temperature of freshly placed concrete during some definite period following placing, casting, or finishing to ensure satisfactory hydration of the cementitious materials and proper hardening of the concrete. When the curing temperature remains in the normal environmental range (generally between 10° C and 30° C), the term "normal curing" is used. When the curing temperature is increased to a |

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| | higher range (generally between 30° C and 70° C), the term "accelerated curing" is used. |
| deflecting of strand | The process of creating draped strand. |
| detensioning of strand or wire | The release of tension from the tendon, usually occurring at the time the prestressing force is transferred from the bed anchorage to the individual pieces cast in the bed. |
| detensioning strength or transfer strength | The minimum concrete strength specified for individual concrete elements before the prestressing force may be transferred to them. |
| draped strand | A strand that is held up at specific points, and held down at others, to form a special desired profile. |
| dry-mix concrete | Concrete designed with very low water/cement ratios and slumps to be used with special consolidation methods, tamping, or extrusion production equipment. |
| dunnage | Materials (usually wood) used for keeping concrete products from touching each other or other materials during storage and transportation. |
| form | A structure or mold for the support of concrete while it is setting and gaining sufficient strength to be self-supporting. |
| form release agent | A substance applied to the forms for the purpose of preventing a bond between the form and the concrete cast in it. |
| formwork | The system of support for freshly placed concrete, including the mold or sheathing that contacts the concrete as well as all supporting members. |
| grips | The parts of a strand vise that actually contact or grip the wires or strands. |
| hardware | A collective term used to cover all items embedded in the concrete (other than reinforcement) or otherwise used in connecting precast elements or attaching or accommodating adjacent materials or equipment. |
| jig | A device to align parts of an assembly, usually for pre-assembling reinforcing steel and hardware cages, with a minimum of measurement and consistent accuracy, from one cage to the next. |

| | |
|--|---|
| lifting frame (or spreader beam) | A device designed to provide two or more lifting points of a precast concrete element with predictable load distribution and prearranged direction of pulling force during lifting. |
| machine-cast products | Products cast by one or more machines specifically designed for the purpose. Slipform and extrusion machines are types of casting equipment used to make solid or hollow-core slabs. |
| machine finish | Finishes applied by special tools while the concrete is still in the forms and plastic. |
| no-slump concrete | Concrete with a near-zero slump to be used with special consolidation methods, tamping, or extrusion production equipment. |
| precast concrete | A concrete element cast in a location other than its final position in service. Precast concrete may be produced at the job site, in temporary plants, or in permanent factories. |
| precast concrete element | A general term for any precast product regardless of classification or application. The term includes any nonconcrete items incorporated in the element at the time of manufacture. |
| prestressing bed | The platform and abutments needed to support the forms and maintain the tendons in a stressed condition during placing and curing of the concrete. |
| retarder | An admixture that delays the setting of concrete paste. |
| screeding | The smoothing or leveling off of freshly cast concrete by manual or mechanical means. A screed usually has a wooden or metal edge that is moved horizontally across the concrete, pushing excess material in front of it and filling in low places. |
| self-stressing forms | Equipment that, in addition to serving as forms for concrete, accommodates the pretensioned strands (or wires) and sustains the total prestressing force by suitable end bulkheads and sufficient cross-sectional strength. |
| slump | The drop from the top of a slump cone to the top of the unsupported concrete after the sudden removal of the supporting slump cone. The difference in height, measured in inches or centimeters, is the slump of the concrete. A wet or soft mix slumps more than a dry or stiff mix. |

| | |
|-------------------------|---|
| strand chuck or vise | A device for holding a strand under tension. |
| stripping | The process of removing a precast concrete element from the form in which it was cast. |
| two-blocking | The action of the crane hook block being pulled into the crane boom head. |
| water/cement ratio | The weight of water relative to the weight of cement in a concrete mix. Enough water must be added to the mix to provide hydration. Excess water improves workability but reduces strength. |

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