ROICC ASBESTOS WORKSHOP

April 25, 2000

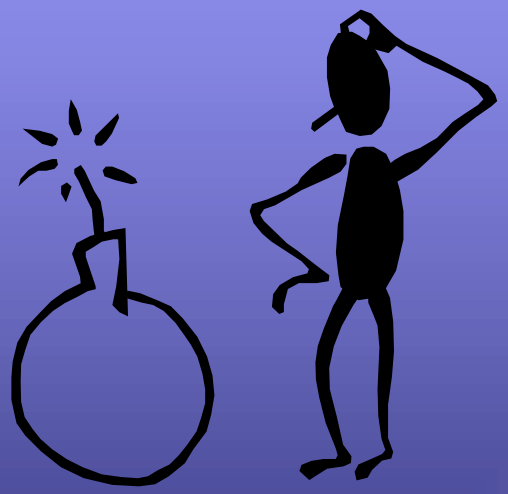
Presented by:

Susan M. Hauser, PE
Head, Civil, Structural and Environmental Specifications Branch
Engineering and Design Division

Mark C. Blaha
Civil, Structural and Environmental Specifications Branch
Engineering and Design Division

Bill Garrett, PE
Construction Safety Manager
Construction Engineering Branch
Construction Division

What Materials Contain Asbestos?



1. Pipe Insulation
2. Floor Tile, Mastic
3. Window Caulk, Glaze
4. Cloth Wall Finishes
5. Caulking
6. Ceiling Tile
7. TSI Thermal System Insulation
8. Roofing Mastic/Felts
9. High voltage cable fire proofing
10. Gasket material
11. Textured finishes
12. Sprayed on fire proofing
13. Transite siding/roofing
14. Joint compound

REGULATIONS

- AHERA -Asbestos Hazard Emergency Response Act
- ASHARA - Asbestos School Hazard Abatement Reauthorization Act
- NESHAP - National Emission Standards for Hazardous Air Pollutants
- OSHA - Occupational Safety and Health Administration
- ASHAA - Asbestos School Hazard Abatement Act

Regulations (cont'd)
Chronology of Asbestos Legislation

- 1971 - Asbestos listed as hazardous air pollutant
- 1978 - All friable spray-on material prohibited, all demolition and renovation covered by no visible emissions standard (EPA/NESHAP)
- 1982 - Identification and notification of friable ACM in schools rule (EPA/TSCA)
- 1984 - Current EPA/NESHAP rule formally recognized; ASHAA enacted
- 1986 - AHERA enacted (OSHA PELs adjusted)
- 1987 - Worker Protection Rule (OSHA)
- 1990 - Extensive NESHAP revisions
- 1992 - ASHAA reauthorized (ASHARA)
- 1993 - Ban and Phase-Out rule
- 1994 - ASHARA Interim Final Rule published including revisions to MAP; Revised Construction Industry Standards issued.

Asbestos Hazard Emergency Response Act (AHERA) 40 CFR 763 Subpart E

- Describes methods of sampling to determine Asbestos Containing Materials in Schools
- Requires that all schools be inspected for asbestos
- Dictated that accredited persons conduct inspections, develop management plans and design or conduct response actions

Asbestos School Hazard Abatement Reauthorization Act (ASHARA)

- Extended AHERA Model Accreditation Plan to cover all public and commercial buildings
- Increased the minimum number of training hours for accreditation of workers and supervisors performing work
- Requires that accredited asbestos abatement contractors/supervisors and accredited workers be used to supervise and carry out response actions and maintenance actions.

National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 CFR Part 61, Subpart M

- EPA's rules concerning the application, removal and disposal of Asbestos-Containing Material
- Revised Nov 20, 1990 to clarify requirements regarding removal and disposal of ACM
- Category I Nonfriable asbestos
- Category II Nonfriable Asbestos
- Friable Asbestos
- Regulated Asbestos Containing Material (RACM)

NESHAP - Regulated Asbestos Containing Material (RACM) Includes:

- Friable ACM
- Category I nonfriable ACM that has become friable
- Category I nonfriable ACM that will be subjected to sanding, grinding, cutting or abrading
- Category II nonfriable ACM that has a high probability of becoming crushed into powder during demolition/renovation

OSHA 29 CFR 1910.1101 (Asbestos)

- Defines different classes of asbestos work
- Class I- removal of TSI and surfacing ACM or PACM
- Class II- removal of all ACM which is not TSI or surfacing material and includes wallboard, floor tile and sheeting, roofing and siding shingles and mastics

OSHA (Cont'd) - Classes of Work

- Class III- repair and maintenance operations where TSI and surfacing ACM or PACM is likely to be disturbed
- Class IV- maintenance and custodial activities involving cleanup of dust and debris from Class I, II and III activities
- Unclassified work - removal of asbestos materials that contain less than 1% asbestos

Sampling Required by the Regulations

- AHERA - Bulk sampling using PLM for identification of ACM; Air Sampling using TEM for Final Clearance of Asbestos work in schools
- NESHAP - Bulk sampling (defines single-layer sampling) for identification of ACM for disposal purposes
- OSHA - Air sampling for worker protection

Bulk PLM vs. Bulk TEM

- PLM-Polarized Light Microscopy - Visual (can be confirmed with point counting) - method required by AHERA and OSHA
- TEM - Transmission electron microscopy- not required by any regulation for bulk sampling. Used on floor tile due to matrix interference in the PLM method to detect asbestos. Only EPA protocol for TEM bulk sampling is for floor tile.

Air Sampling for OSHA compliance (PCM vs. TEM)

- The contractor is required by OSHA asbestos standard to conduct personal monitoring to determine worker exposure to airborne fiber levels. The air sampling data is used to determine the appropriate level of respiratory protection that should be worn and to document that fiber levels are being effectively controlled.
- After final cleanup of the work area, final clearance sampling must be conducted before critical barriers can be removed and the area cleared for additional work.

Air Sampling for OSHA compliance (PCM vs. TEM)

- PCM - Phase Contrast Microscopy - Analyst must count all fibers within certain size limitations (can be done on site for immediate readings)
- TEM - Transmission Electron Microscopy - Gives positive identification of asbestos fibers (cannot be done on site)

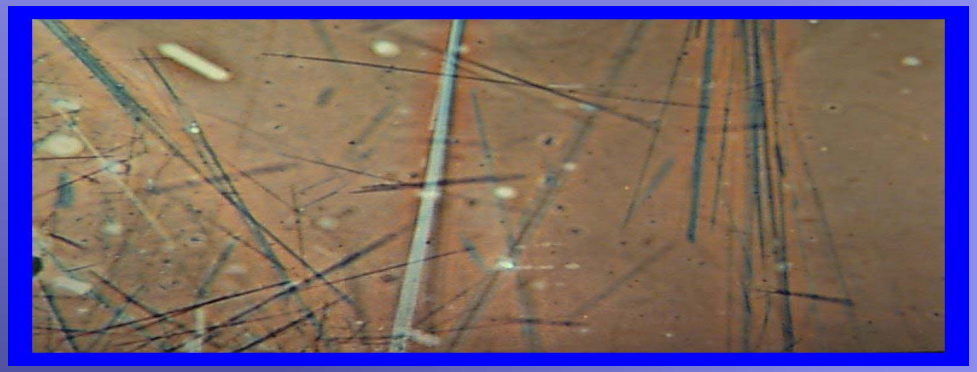
Disposal Requirements

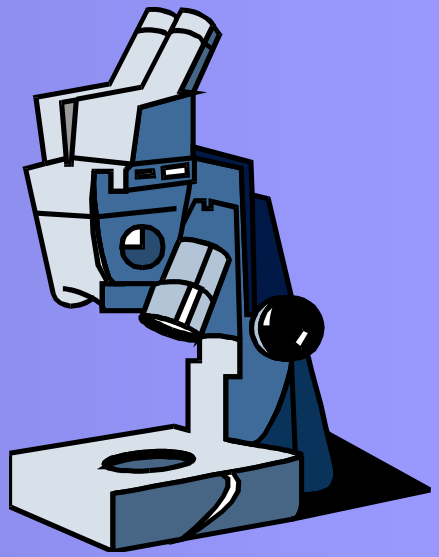
- NESHAP governs disposal of Asbestos Containing Material (ACM)
- Sampling results of materials sampled in accordance with NESHAP control disposal requirements (determination of ACM).
- NESHAP indicates that drywall systems should be sampled as a composite system and not as individual layers therefore if the drywall system is not classified as ACM then NESHAP does not apply.

Existing Asbestos Surveys

- Generally were conducted to comply with ASHARA in order to identify asbestos that would affect the current operations in the building
- Sometimes do not have enough information to use for a renovation/demolition job

Environmental Testing in Facilities prior to Renovation/Demolition





Why do we need to test?

- EPA requires building owners test "suspect materials" for asbestos prior to renovation or demolition activities. Suspect materials include thermal system insulation, surfacing materials, and miscellaneous materials such as tile, roofing felt, concrete pipe, outdoor siding, and fabrics.

Why do we need to test? (cont.)

- OSHA standards require that building owners with surfacing materials, thermal system insulation, and resilient flooring materials, installed not later than 1980, "presume" these to be asbestos containing prior to any activity that would disturb these materials, unless PLM testing determines that they are non-asbestos.

Project Manager Responsibilities For all demolition/renovation jobs:

1) Contact the Activity Asbestos Program Manager to obtain a copy of existing asbestos survey.

2) Determine the number additional samples required to complete the abatement/environmental design. Existing surveys probably won't adequately identify all asbestos materials impacted by the project.

Project Manager Responsibilities For all demolition/renovation jobs:

3) Prepare "Scope of Work For Performing Asbestos, Lead , PCBs and Mercury Surveys for Demolition and Renovation Designs."

Environmental Resources

Susan Hauser, Code 406 322-4301

HauserSM@efdlant.navfac.navy.mil

Mark Blaha, Code 406 322-4306

BlahaMC@efdlant.navfac.navy.mil

The ***Environmental Design Guide*** further defines the services requested in the Appendix "A". It is available on the Web at:

http://www.efdlant.navfac.navy.mil/downl/lantops_04/design_guide_environmental.pdf

100% CONSTRUCTABILITY REVIEW (What to look for)

- Asbestos Survey included in Specification Package (usually behind 13281) or
- Asbestos Survey available from ROICC office during bidding (not the preferable alternative.)
- Plans indicate exact location of asbestos with details that allow the contractor do a quantitative takeoff

100% CONSTRUCTABILITY REVIEW (What to look for) cont'd

- Asbestos Specification Section 13281
  - include language for PQP as a first tier subcontractor
  - description of work is inclusive and does not dictate removal methods

PRE-ABATEMENT CONFERENCE (with Asbestos and Demolition Subcontractor(s))

- Hold a meeting to discuss the manner in which changes will be handled
- Determine if Contractor desires any clarification of the existing asbestos report
- Indicate that any additional sampling will be accomplished by the Government

PRE-ABATEMENT CONFERENCE (with Asbestos and Demolition Subcontractor(s)) cont'd

- Determine if the Contractor desires additional sampling and contact Bill Garrett if the request seems unreasonable
- Invite Code 04 representative if there are indications that problems may arise

ASBESTOS SUBMITTALS (required by Section 13281)

- Private Qualified Person (PQP) Documentation
- Laboratory Certifications (website to check to see if they are certified - http://ts.nist.gov/ts/htdocs/210/214/scopes/programs.htm)
- Competent Person Documentation
- Asbestos Hazard Abatement Plan (certified and signed by the PQP)

ASBESTOS SUBMITTALS (required by Section 13281) cont'd

- Air Monitoring Data (personal and area data)
- Final Visual Inspection and Final Clearance Sampling (report signed by PQP)

DURING CONSTRUCTION

- Additional Sampling requested by the Contractor
  - Do not let Contractor perform
  - Sampling should be conducted by the Government on any material that was not previously discovered and tested in the original asbestos survey
  - IQ contracts are available for use by the ROICC offices
  - Contract allows 14 days for Government to identify questioned material

DURING CONSTRUCTION (IQ Contract for Sampling Services)

- Contract No: N62470-00-R-3401
  - 02 POC: Mark Gostel, Code 0222, (757) 322-8233
  - 04 POC: Susan Hauser, Code 4061, (757) 322-4301
  - 04 POC: Patrick Beville, Code 4061, (757) 322-4305
- First contact Project Manager to initiate Scope of Work and Government Estimate (contract has unit prices for asbestos samples and sampling efforts)
- Indicate 24 hour turn around time for sample analysis

DURING CONSTRUCTION (cont'd)

- Change orders will be used for additional materials of already identified ACM (i.e. additional insulation that is found behind a wall and of the same age and type already being removed.) NO NEED TO TEST - just classify it as asbestos and process the change order

DURING CONSTRUCTION (cont'd)

- Air Sampling During Construction
  - Personal air sampling on asbestos workers until a "Negative Exposure Assessment" is made.
  - Area sampling within the regulated area and at any enclosure openings
  - Final Clearance sampling in order to disassemble the regulated area

DURING CONSTRUCTION (cont'd)

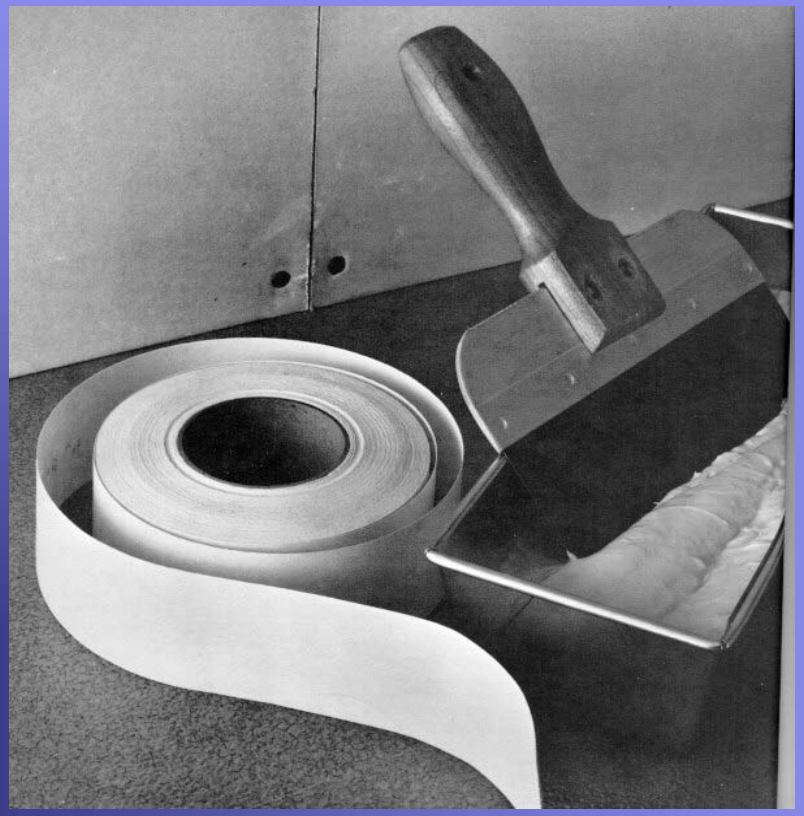
- Final Visual Inspection and Clearance Sampling
  - Final visual must be conducted by the PQP in order to deem the cleanup sufficient to collect the final air samples
  - Final air sampling must be conducted and must be less than **0.01 fibers per cc** (or background levels whichever is greater)
  - Should any samples indicate higher than the required level, Contractor must re-clean area and repeat sampling.

DURING CONSTRUCTION (cont'd)

- 3rd Party Monitoring for Buildings to be reoccupied
  - Should be considered for all buildings undergoing renovation
  - Duplicates the work of the PQP at the final visual inspection and clearance sampling stage to provide an independent inspection and air sampling data.

ISSUES AND CASE STUDIES

Drywall with Asbestos Containing Joint Compound



OSHA Standard No. 29 CFR; 1910.1001(b); 1915(b); 1926.1101(b)

- Above three standards, as interpreted by OSHA define sheet-rock and joint compound as two different materials
- If sampled, separate analysis of each material is required to determine if over 1%
- Composite bulk samples (sheet-rock & joint compound) therefore not allowed

Federal Register page 41032 Vol. 59, No. 153, Aug 10,1994

- Above declares joint compound a 'finishing material' and therefore Class II work.
- Recall that 'surfacing materials' are considered Class I work.
- Demo of sheet-rock walls is Class II work

Surfacing vs. Finishing Mat'ls.

- 1994 revisions (preamble); Surfacing materials are "high risk", meaning fibers are loosely bound to the matrix.
- OSHA believes that the fibers in joint compound are too tightly bound for the compound to belong to the "high risk" category.

USEPA NESHAP 40 CFR part 61, subpart M, 55 FP.48406

- Multi-layer sample analysis of ACM is required when ever possible to distinguish between the layers.
- OK to include a little wall board in a paint sample or skim coat plaster sample.
- Joint compound/Wallboard is an exception.

Federal Register Vol. 60, No. 243, Tuesday, December 19, 1995

- Part I 'Clarifications of multi-Layered System' refers to Jan. 5, 1994 Fed. Reg. Which states, "This clarification basically stated that all multi-layered systems except for wall systems where joint compound was used only at the joints and nail holes must be analyzed as separate materials, and results were not allowed to be combined to determine average asbestos content (continuing the policy that dilution of an asbestos-containing material is not allowed)."

Summary - OSHA & EPA Requirements

- EPA views joint compound and wall board as a composite material. Sampling of composite system accepted for disposal purposes.
- OSHA- Wallboard/joint compound, if sampled, must be sampled using single layer analysis. Greater than 1 % asbestos in the joint compound means compound must be treated as ACM; demolition is a Class II operation.

Case Studies

- Family Housing Sugar Grove, WV
- Portsmouth Medical Center (Building 1 Renovation)
- Family Housing Yorktown, VA

Case Studies

- During design, sampling identified asbestos and lead containing materials.
- Environmental Report included with Bid Documents.
- Asbestos in joint compound/wall board not greater than one percent.

Building 1 Renovation

- After award, **Contractor** took additional samples.
- But the Contract says...

Building 1 Renovation

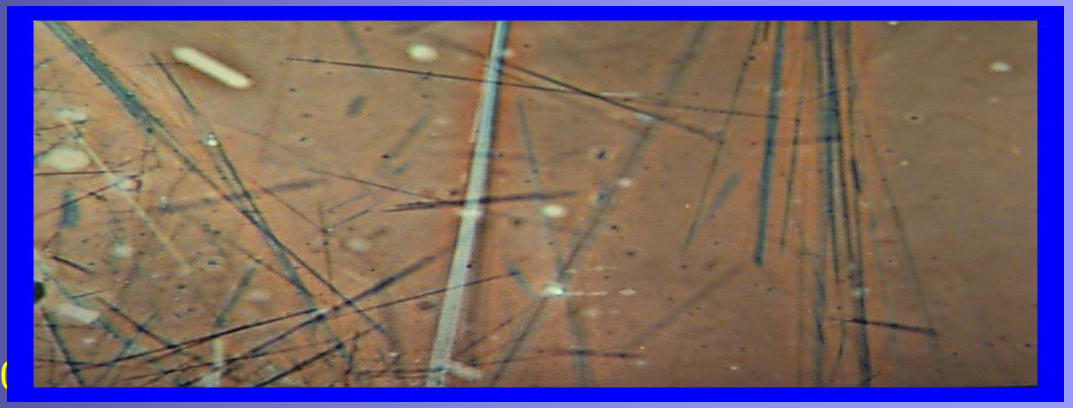
- Section NFGS 01525, "Safety Requirements" (Similar verbiage also appear in NFGS Section 01575, "Temporary Environmental Controls.")

3.1.2 Unforeseen Hazardous Material

The design should have identified materials such as PCB, lead paint, and friable and nonfriable asbestos. If additional material, not indicated, that may be hazardous to human health upon disturbance during construction operations is encountered, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the **Government** will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to "FAR 52.243-4, Changes" and "FAR 52.236-2, Differing Site Conditions."

Building 1 Renovation

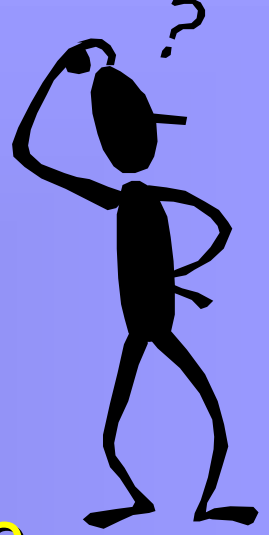
- Contractor took 177 samples. Wallboard joint compound sampled using single layer(just the compound) analysis.
- Contractor claims OSHA requires he take the samples and use single layer analysis.



Building 1 Renovation

- $2.0 Million dollar change order submitted. ($800,000 for treatment of all work associated with wallboard as Class II operation, and disposal of material as ACM)

What does OSHA require of the Building Owner and employer?



- According to 29 CFR 1926.1101 in pre-1980 buildings the building owner and/or employer must "presume" surfacing material, thermal insulation, and floor tile to be ACM, unless testing indicates otherwise.

What does OSHA require of the Building Owner and employer?

- Wall systems where joint compound was used only at the joints and nail holes (not a surfacing material) the owner is not required to test, per OSHA.
- However, if the system is sampled, it must be analyzed using single layer methods.
- And the employer is required to protect his workers...

What does OSHA require of the Building Owner and employer?

- To ensure that workers aren't exposed, the employer may either sample or conduct an exposure assessment to ensure that employees are not exposed above the PEL, or excursion limit.

What does OSHA require of the Building Owner and employer?

- Utilizing wet methods to reduce emissions during drywall work, PEL typically not exceeded.
- If PEL is exceeded, work proceeds with controls, as OSHA Class II work.

What does OSHA require of the Building Owner and employer?

- If fibers are detected, but PEL is not exceeded, work proceeds as "unclassified work," utilizing wet methods, and daily clean-up.
- If no fibers are detected, the work is no longer an asbestos operation.

Proposed Addition to NFGS-13281

Add to Definitions:

1.2.24 Unclassified Work

Work operations conducted in areas where the asbestos or asbestos product is below one percent.

Following 1.3 Description of Work

[1.3.1.1 Presence of Asbestos Containing Joint Compound

It is presumed that compound found at the joints between drywall sections in the building contains asbestos. Composite bulk sampling indicates that the drywall/joint compound system contains not greater than one- percent asbestos, and is therefore non-regulated asbestos containing material per NESHAPS.

Proposed Addition to NFGS-13281

(continued)

The Contractor shall base bids on conducting an exposure assessment, in accordance with 29 CFR 1926.1101, for work involving the drywall systems. The assessment shall be supervised by the Contractor's Competent Person and conducted in the presence of the Private Qualified Person. Base bids on the assessment resulting in work defined as "unclassified asbestos work," but below the asbestos permissible exposure limit. Requirements of 29 CFR 1926.1101, paragraph g (1)(ii) and g(1)(iii) apply to unclassified work.

Proposed Addition to NFGS-13281

(Continued)

Based on the experience of the Contractor and/or the use of a specific process or method for performing the work, the Contractor may be able to provide historic data (previous 12 months) to demonstrate that airborne exposures are controlled below the permissible exposure limit. Such methods or controls shall be fully presented in the Asbestos hazard abatement plan.]

Summary of Renovation Projects Involving Drywall Work

- Test existing building materials to be impacted by renovation activities in accordance with requirements of OSHA and USEPA.
- Include environmental report with bid documents.
- Include requirement for exposure monitoring in bid documents.

Air Sampling (Exposure Assessments) and Historical Data

- OSHA requires periodic air monitoring for Class I and Class II work *unless a negative exposure assessment has been made*
- For all other work under the standard, periodic monitoring is required *only where the PEL is expected to be exceeded*
- PEL - 8 hour TWA of 0.1 fibers per cc
  - Excursion Limit - 1.0 fibers per cc as averaged over a period of 30 minutes

Air Sampling (Exposure Assessments) and Historical Data (cont'd)

- Negative Exposure Assessment
  - For any one specific asbestos job under those work conditions having the greatest potential for releasing asbestos which demonstrates employee exposures will be below the PEL
- Historical Data
  - Where the employer has monitored prior asbestos jobs for the PEL and excursion limit within the last 12 months and data was obtained under work conditions that "closely resemble" the new job

Unclassified Work (Asbestos less than 1%)

- Sampling reveals less than 1% ACM
- OSHA 1926.1101 still applies and is called "unclassified work"
- Must meet 1926.1101 (g)(1)(ii) and (g)(1)(iii) which requires:
  - wet removal methods
  - prompt cleanup and disposal
- Asbestos workers not required
- Competent person can be Project Superintendent (minimal training requirements)